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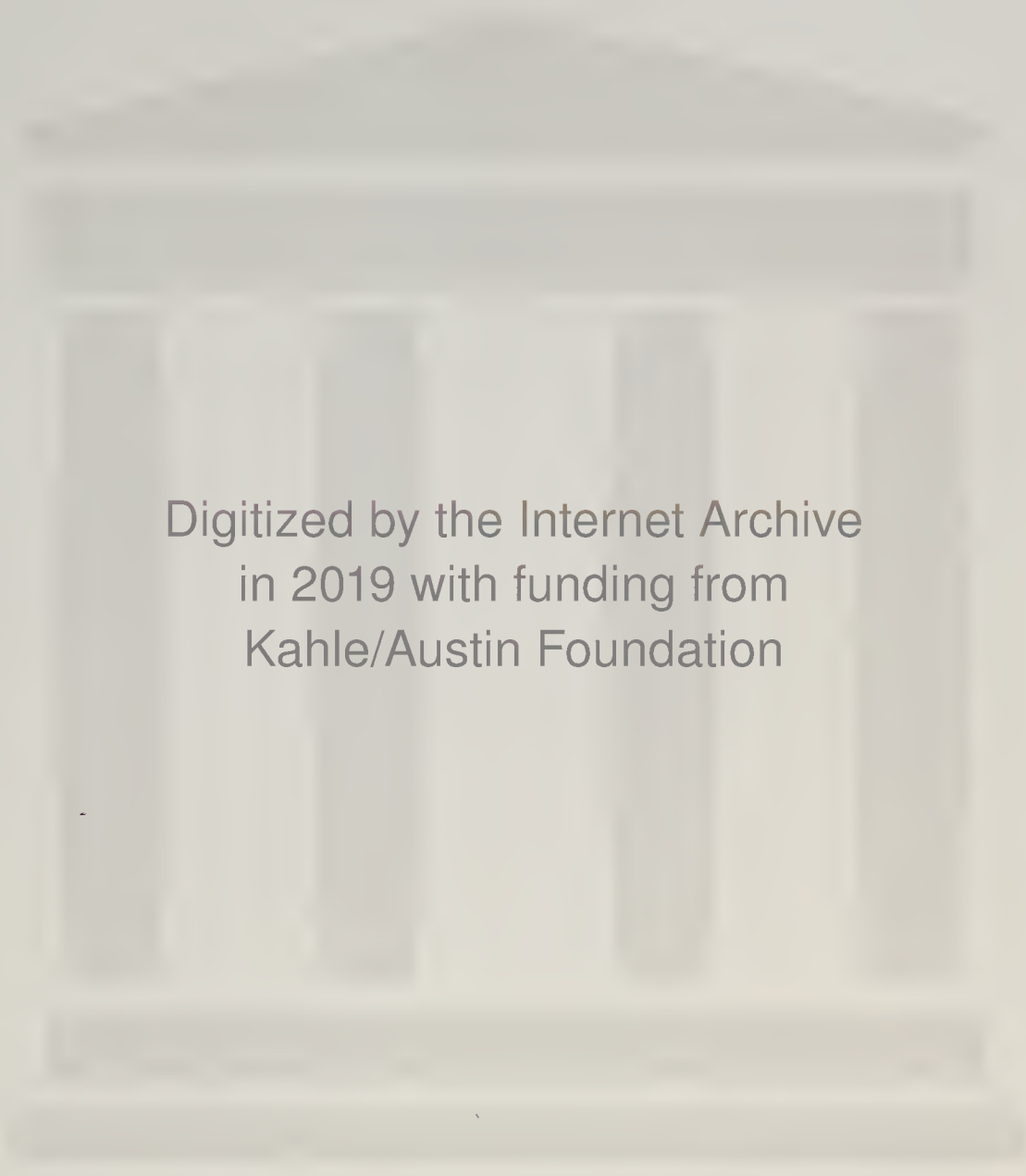
1917

BRITISH COLUMBIA



THE MINERAL PROVINCE OF CANADA.





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D.C. Bureau of Mines

Della Lake, Alberta Mining Division.



B.C. Borey & Sons

Hydraulic mining on Otter Creek, Adlin.

BRITISH COLUMBIA

—THE—

MINERAL PROVINCE OF CANADA

—BEING—

A Short History of Mining in the Province, a Synopsis of the Mining
Laws in Force, Statistics of Mineral Production to Date,
and a Brief Summary of the Progress of
Mining during 1916



THE GOVERNMENT OF
THE PROVINCE OF BRITISH COLUMBIA

PRINTED BY
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BRITISH COLUMBIA, THE MINERAL PROVINCE OF CANADA.

British Columbia has produced to date \$74,620,103 of Placer Gold, \$91,350,784 of Lode Gold, \$41,358,012 of Silver, \$36,415,124 of Lead, \$114,559,364 of Copper, \$7,212,759 of Zinc, and \$165,829,315 of Coal and Coke; \$27,215,254 other metals and building-stone, etc., a total production of \$558,560,715.

The Mineral Production for 1916 was \$42,290,462.

Lode-mining has only been in progress for about twenty-three years, and not 30 per cent. of the mineral land has been even prospected; 250,000 square miles of unexplored mineral-bearing land are open for prospecting.

Mineral locations are granted to the discoverers for nominal fees.

Absolute titles are obtained by developing such properties, the security of which is guaranteed by Crown grants.

The Mining Laws of this Province are more liberal and the fees lower than in any Province in the Dominion, or any colony of the British Empire.

Full information, together with Mining Reports and Maps, may be obtained from the Agent-General for British Columbia, British Columbia House, 1 and 3 Regent Street, London, S.W., or by addressing

HON. WM. SLOAN,
Minister of Mines,
Victoria, B.C.,
Canada.

WILLIAM FLEET ROBERTSON,
Provincial Mineralogist,
Victoria, B.C.,
Canada.

MINING IN BRITISH COLUMBIA.

British Columbia, the most westerly Province of the Confederation forming the Dominion of Canada, comprises, principally, that section of British North America lying to the westward of the summit of the Rocky mountains. The northern boundary of the Province is the 60th parallel; its southern boundary the United States of America, or, practically, the 49th parallel; on the west it is bounded by the Pacific ocean, and on the east by the Rocky mountains as far north as the 54th parallel; beyond that by the 120th meridian of west longitude.

The total area of British Columbia is about 382,000 square miles, of which 285,000 square miles are estimated to be as yet uncultivated.

The country is traversed in a north-westerly direction by four more or less continuous chains of mountains, between which lie valleys of varied width, well suited for agriculture.

Each of these mountain ranges has been proved to contain mineral in sufficient quantity to be profitably mined, while the valleys of the interior, lying immediately to the west of the Rocky Mountain range proper, contain placer gold throughout the whole length of the Province and have been and are being worked in places to great profit. To quote from a report of the late Dr. Geo. M. Dawson, Director of the Geological Survey of Canada:—

“While it may now be safely affirmed that gold is very generally distributed over the entire area of the Province of British Columbia, so much so that there is scarcely a stream of any importance in which at least ‘colours’ of gold may not be found, the enumeration of the principal discoveries of mining districts shows very clearly that most of these are situated along the systems of mountains and high plateaux which comprise the Purcell, Selkirk, Colorado, and Cariboo ranges, and the north-west continuation lying to the south-west of the Rocky Mountain range, properly so called, and parallel in direction with it.”

It may be truthfully said that the whole Province has been proved worthy of systematic examination, or “prospecting” as it is usually termed. As yet, serious work of this description has been confined to within a comparatively few miles of the railways, and not more than 25 per cent. of the entire area of British Columbia can be said to be really known, while not even half of that portion has been examined closely or in detail, by which means only will its value be shown.

It will thus be seen that about 250,000 square miles of country, known to be extensively mineralized, still remain as a virgin field for the “prospector”* and for the investor in undeveloped “prospects”* a field such as exists to-day in but few other places in the world.

Of what value this great area is likely to prove can best be judged by an examination of the results already obtained from the small portion of the Province so far developed, results which are shown in the tables of production which follow.

It may reasonably be asked why development of these mineral resources has been so long delayed. The answer is easily found in the geographic position of the country and in the lack, until recent years, of transportation facilities. The metal as well as the money markets of the world are in Europe and on the Atlantic coast of North America, and since, prior to the completion of the Canadian Pacific Railway in 1885, a journey to British Columbia was a question of months of time and great expense, it may well be seen that the transportation of mineral or metal, other than the precious metals, from this Province to a market was practically impossible.

The following brief outline of the mineral development of British Columbia may not be out of place:—

Naturally the country was first explored and opened up from the Pacific seaboard. As early as 1835 coal was discovered at Fort Rupert by the Hudson's Bay Company, and in 1851 the same company opened up the extensive coalfields at Nanaimo, Vancouver Island. In

Coal. those days the market was very limited, and it was not until 1875 that the output of the Province exceeded 100,000 tons per annum. Since that time, however, the market has gradually increased until, in 1902, about 1,400,000 tons of coal and

* The terms “prospector,” “prospect,” are applied, the former to one who sets out with the object of exploring for mineral, and the latter to the discovery made, which may or may not be afterwards developed into a mine.

128,000 tons of coke, and in 1910 some 2,800,046 tons of coal and 218,029 tons of coke was produced, the market and transportation facilities, rather than the mines, being the limiting factors in the production.

In 1916 the gross output of coal was 2,485,580 tons (2,240 lb.), while the net production was 2,084,093 tons of coal and 267,725 tons of coke, which figures, compared with those of the previous year, show an increase of nearly 30 per cent. in coal and 9 per cent. in coke production. During the previous three years the production of coal had steadily fallen off, owing partly to the competition of California fuel-oil, and latterly because of the industrial depression due to conditions arising from the European war. It now seems apparent that the rise in the price of California oil will, in the near future, cause the railways and industrial concerns to revert back to the use of coal as a fuel.

The Coast collieries have produced to date a total of over 27,000,000 tons of coal, and made a gross output during the year 1916 of 1,603,310 tons of coal; 27,604 tons of coke being manufactured.

The Crowsnest Pass coalfields, on the western slope of the Rocky mountains, were made accessible by railway in 1898 and are now served by two competing lines.

The gross output of this field to date is 13,591,577 tons of coal, a part of which has been made into coke, of which 3,363,210 tons has been produced.

The output for 1916 has been detrimentally affected by the war, but amounted to a gross output of coal of 882,270 tons, the net output of coal being 530,279 tons, while 240,121 tons of coke was produced.

At present the only large working collieries in the Province are in the two districts just mentioned, but the distribution of coal seems general throughout the Province, since it is known to exist in places along the whole western slope of the Rocky mountains; it is found in the interior valleys at Nicola and Princeton, on the Thompson river, in Peace River District, and in the Omineca District—a coalfield is being developed on the headwaters of the Skeena, the coal being anthracitic in character. Coal occurs on the Pacific coast on Vancouver Island, on the Queen Charlotte islands, and along the Skeena river, while recent reports confirm its discovery in the Atlin Mining Division; the coal found is a first-class bituminous, carrying from 60 to 75 per cent. of fixed carbon, from 20 to 30 per cent. of volatile combustible matter, and from 3 to 9 per cent. of ash.

The coal reserves of the Province have been estimated by the Geological Survey as amounting to seventy-five billion metric tons.

As will be seen, the greater part of this immense reserve of power—for coal is power—remains dormant at present, an asset reserved for use in opening up the coming trade of the Pacific ocean.

In 1858 alluvial or "placer" gold was found in British Columbia in the bars of the lower Fraser river. Hardy and adventurous prospectors followed the stream up—following the golden trail thus "struck"—and in 1860 and 1861, on the headwaters of the river,

Placer-mining. they discovered the exceedingly rich "placers" of the Cariboo District, which have produced gold to the value of about \$50,000,000. The news of these rich finds travelled abroad, and brought about a rush of gold-seekers from the then failing goldfields of California and from almost every part of the world. From this time practically dates the opening-up and settlement of British Columbia.

Within the next ten years the Province produced about \$33,000,000 worth of "placer" gold, the greatest production in any one year being in 1863, and amounting to about \$4,000,000. All of this gold was obtained with pick and shovel, without the aid of any machinery, which, as a matter of fact, could not be taken into the country over the crude trails and roads which served well enough for the pack animals of the early miners and prospectors.

As has been the history of all placer-mining camps, a few years saw all the more accessible gold skimmed from the shallow deposits, until, gradually, as the workings became too deep for the ordinary pick-and-shovel methods, then only available, the placer output gradually dropped, until in 1898 the annual production was only a little over half a million dollars.

In 1899, however, placer-mining was revived by the discovery of new and virgin fields in the Atlin District, a continuation to the north of the famous Cariboo and Omineca diggings of the past, and the connecting link between these and the more recent, but equally famous, goldfields

of the Yukon, thus completing the chain of continuous "placer" districts from the 49th parallel, north-westerly, to the 69th parallel.

Fort Steele, Revelstoke, the valley of the Fraser river, Quesnel Forks, Barkerville, Manson, Telegraph Creek, and Atlin may be said to have been centres of known "placer" goldfields, pointing with no uncertain finger to the Yukon, and indicating a flow of gold-bearing wash from the north-western to the south-eastern corner of the Province.

In the vast area covered by this flow, the places mentioned are only spots at which gold has been found in sufficient quantity to be profitably mined by the old pick-and-shovel methods. That other such spots remain to be discovered seems probable, while it is certain that, in a large percentage of the intervening areas, gold exists in quantity such as it will pay well to mine by modern methods.

A continued falling-off in the production of placer gold might have been expected in the year 1900, had it not been that machinery and water-power were beginning to be substituted for the laborious methods of the early miner, a change rendered possible by the improvement in transportation facilities.

The modern methods of working placer deposits demand a heavy initial outlay for plant, but a large number of powerful companies are now engaged in British Columbia, having installed the necessary machinery and equipment, with such prospects of success that the old placer-grounds promise, under the stimulus of hydraulic mining, to yield an output of gold not previously attained in the palmiest days of placer-mining proper.

The new hydraulic companies referred to have taken up a large number of leases of placer-ground in the Province, but this branch of the mining industry is, at present, only in its infancy in British Columbia.

Such, briefly, is the history of placer-gold mining in the Province; that it is only the beginning of such, the improved methods of mining, and the new districts each year becoming accessible, leave little reason for doubt.

The total production of placer gold to date is about \$74,620,103.

It is only the repetition of the history of all placer-mining countries that prospecting for lode mines received little or no attention until after the placer-grounds have been so culled over as to force the prospector into new fields of labour. Nor is this to be wondered

Lode-mining. at; the placer is the "poor man's mine"; he needs little or no capital to work it; its product is cash, to all intents and purposes, and he is his own master—all attractions too great for the sturdy independence of the prospector to allow him to think of searching for lode mines, which, when found, require so much capital to work that they leave but very small interest in the property with the original owner or "locator," while, at the same time, the necessity of transportation facilities for the product of the mine limits the field of search to within a comparatively few miles of a railway or navigable waterway.

Railway facilities are comparatively recent acquisitions in British Columbia, our first line—the Canadian Pacific Railway—having been completed in 1885, and following, naturally, the least mountainous path across the Province. From the main artery of communication thus afforded, "prospectors" penetrated into the adjacent country by following up the main waterways which abound, with the result that discovery after discovery of valuable mineral was recorded.

Development of these mineral discoveries was unavoidably slow, being delayed by the lack of transportation facilities, which, it will be readily understood, could not be obtained until sufficient work had been done on the "prospects" found to prove their value and to give reasonable ground for believing that a proper and sufficient return would be obtained on the capital invested in the establishment of the requisite means of carriage and communication.

Thus, it was not until 1893 that the lode mines of British Columbia really began to be productive, the output from this source during the six years immediately prior to that date amounting to an average value of only about \$60,000 a year, derived from selected rich ores found near the existing lines of transportation.

In 1893, however, the value of the production of the lode mines of the Province rose to \$300,000, since which time there has been a steady increase, until in 1901 the output from this class of mining had reached a value of \$13,683,044, and although it fell off slightly in 1902, the decrease was due, principally to the lesser market values prevailing; since 1903 an upward tendency is again apparent. The increase thus shown in the short period of a decade gives

ground for faith in the country as a future large producer of mineral wealth, and indicates that British Columbia will prove to the capitalist a profitable field for investment.

The total production of lode gold to date is \$91,350,784, of which \$4,587,334 was produced in 1916.

Such, then, is a brief summary of our mineral development, the details of which will be more fully found in the statistical tables following, which are taken from the Report of the Minister of Mines, and are compiled by the Provincial Mineralogist from the sworn statements of returns by the mine-owners and mining companies throughout the Province.

Attention is invited to these statistics and to the growth of the mining industry as therein indicated, since they speak both clearly and with due authority of the present standing and future prospects of British Columbia as a mining country.

The development of the mining industry has been of such rapid growth that the demand for skilled, or even ordinary, labour has of late years been greatly in excess of the supply, and there is, consequently, plenty of work to be found in the country for miners and mine-workers generally, and the attention of British miners is directed to this field of labour.

The country is fairly well supplied with clerical and office assistance, and there is at present a fair supply of tradesmen of almost every sort. The country is great and growing in importance; there is room for and need of a greatly increased population.

The current wages paid in and about the mines are as follows:—

Miners	receive from	\$3.30 to \$4.50 per day	(14 to 19 shillings).
Helpers	„	2.50 to 3.50 „	(10 to 14 shillings).
Labourers	„	2.50 to 3.00 „	(10 to 12 shillings).
Blacksmiths and mechanics	„	3.50 to 5.00 „	(14 to 20 shillings).

During the past year the higher market prices of metals has greatly increased the profits of the mining companies, most of which have increased the wages of the men on a sliding scale based upon the selling price of the metals. In some cases this increase has amounted to a dollar a day.

The climate of the country is favourable—much milder than east of the Rocky mountains. The conditions of life are easy; luxuries are scarce but want is unknown. The laws are just and equitable, and the administration thereof fair and sure, as is guaranteed wherever the British flag flies at the mast-head.

Mention has been made of the geographical position of British Columbia as having in the past been a hindrance to development. It would now seem, however, that the markets of the world may in the future be on the borders of the Pacific ocean, and that the disadvantages in the matter of freights from which this Province has suffered will be reversed, enabling us to more than compete with all in the coming trade.

The markets for our mineral wealth have, in the past, been on the Atlantic seaboard; in the near future they may be on the Pacific coast. We shall, too, shortly, have our own refineries within the boundaries of the Province, so that our metals shall be turned out in marketable shape and sold from here direct, thus making a material saving as regards freight.

SYNOPSIS OF MINING LAWS OF B.C.

The mining laws of British Columbia are very liberal in their nature and compare favourably with those of any other part of the world. The terms under which both lode and placer claims are held are such that a prospector is greatly encouraged in his work, and the titles, especially for mineral claims and hydraulic leases, are absolutely perfect. The fees required to be paid are as small as possible, consistent with a proper administration of the mining industry, and are much lower than those of the other provinces of Canada or the mineral lands under Dominion control. Provision is also made for the formation of mining partnerships practically without expense, and a party of miners is enabled to take advantage of these sections of the Acts and work their claims together, without the trouble or expense of forming a joint-stock company.

Considering the success that has characterized alluvial mining on a large scale in British Columbia, the rentals for hydraulic leases are particularly low. It will be found on reference to most of the Australian colonies and Natal that the rentals are, in most instances, eight times as much as in this Province, while the areas permitted are generally much smaller. The period for which leases are granted is practically the same. On a lode mine of 51 acres the expenditure of \$500 in work, which may be spread over five years, is required to obtain a Crown grant, and surface rights are obtainable at a small figure, in no case exceeding \$5 per acre.

The following synopsis of the mining laws will be found sufficient to enable the miner or intending investor to obtain a general knowledge of their scope and requirements; for particulars, however, the reader is referred to the complete Mining Acts, which may be obtained from the King's Printer, Victoria, B.C.

Free Miners' Certificates.

Any person over the age of eighteen, and any joint-stock company, may obtain a Free Miner's Certificate on payment of the required fee.

The fee to an individual for a Free Miner's Certificate is \$5 for one year. To a joint-stock company having a capital of \$100,000, or less, the fee for a year is \$50; if capitalized beyond this, the fee is \$100.

The Free Miners' Certificates all expire at midnight on May 31st in each year. Certificates may be obtained for any part of a year, terminating on May 31st for a proportionately less fee.

The possession of this certificate entitles the holder to enter upon all lands of the Crown, or upon any other lands on which the right to so enter is not specially reserved, and to prospect for minerals, locate claims, and mine.

A free miner can only hold, by location, one mineral claim on the same vein or lode, but may acquire others by purchase. In the case of placer claims, only one claim can be held by location on each creek, ravine, or hill, and not more than two in the same locality, only one of which shall be a "creek" claim.

In the event of a free miner allowing his certificate to lapse, his mining property (if not Crown-granted) reverts to the Crown, but where other free miners are interested as partners or co-owners the interest of the defaulter becomes vested in the company continuing co-owners or partners *pro rata*, according to their interests.

It is not necessary for a shareholder, as such, in an incorporated mining company to be the holder of a Free Miner's Certificate.

Mineral Claims.

Mineral claims are located and held under the provisions of the "Mineral Act."

A mineral claim is a rectangular piece of ground not exceeding 1,500 feet square. The angles must be all right angles unless the boundaries, or one of them, are the same as those of a previously recorded claim.

No special privileges are allowed for the discovery of new mineral claims or districts.

A mineral claim is located by erecting three "legal posts," which are stakes having a height of not less than 4 feet above ground and squared for 4 inches at least on each face for not less than a foot from the top. A tree-stump so cut and squared also constitutes a legal post.

The "discovery post" is placed at the point where the mineral in place is discovered.

Nos. 1 and 2 posts are placed as near as possible on the line of the ledge or vein, shown by the discovery post, and mark the boundaries of the claim. Upon each of these three posts must be written the name of the claim, the name of the locator, and the date of location. On No. 1 post, in addition, the following must be written: "Initial post. Direction of Post No. 2 [*giving approximate compass bearing*]; — feet of this claim lie on the right, and — feet on the left of the line from No. 1 to No. 2 posts."

The location-line between Nos. 1 and 2 posts must be distinctly marked—in a timbered locality by blazing trees and cutting underbrush, and in bare country by monuments of earth or rock not less than 2 feet in diameter at the base, and at least 2 feet high—so that the line can be distinctly seen.

Mineral claims must be recorded in the Mining Recorder's office for the mining division in which they are situated within fifteen days from the date of location, one day extra being allowed for each ten miles of distance from the recording office after the first ten miles. If a claim is not recorded in time it is deemed abandoned and open for relocation, but if the original locator wishes to relocate he can only do so by permission of the Gold Commissioner of the district and upon the payment of a fee of \$10. This applies also to a claim abandoned for any reason whatever.

Mineral claims are, until the Crown grant is issued, held practically on a yearly lease, a condition of which is that during such year assessment-work be performed on the same to the value of at least \$100, or payment of such sum be made to the Mining Recorder. Such assessments must be recorded before the expiration of the year, or the claim is deemed abandoned. If, however, the required assessment-work has been performed within the year, but not recorded within that time, a free miner may within thirty days thereafter, record such assessment-work upon payment of an additional fee of \$10. The actual cost of the survey of a mineral claim, to an amount not exceeding \$100, may also be recorded as assessment-work. If, during any year, work is done to a greater extent than the required \$100, any further sum of \$100—but not less—may be recorded and counted as further assessments. As soon as assessment-work to the extent of \$500 is recorded, the owner of a mineral claim is entitled to a Crown grant on payment of a fee of \$25, and giving the necessary notices required by the Act. Liberal provisions are also made in the Act for obtaining mill-sites and other facilities in the way of tunnels and drains for the better working of claims.

Placer Claims.

Placer-mining is governed by the "Placer-mining Act," and by the interpretation clause its scope is defined as "the mining of any natural stratum or bed of earth, gravel, or cement mined for gold or other precious minerals or stones." Placer claims are of four classes, as follows:—

"'Creek diggings': any mine in the bed of any stream or ravine:

"'Bar diggings': any mine between high- and low-water marks on a river, lake, or other large body of water:

"'Dry diggings': any mine over which water never extends:

"'Precious-stone diggings': any deposit of precious stones, whether in veins, beds, or gravel deposits."

The following provisions as to extent of the various classes of claims are made by the Act:—

"In 'creek diggings' a claim shall be two hundred and fifty feet long, measured in the direction of the general course of the stream, and shall extend in width one thousand feet, measured from the general course of the stream five hundred feet on either side of the centre thereof:

"In 'bar diggings' a claim shall be:—

"(a.) A piece of land not exceeding two hundred and fifty feet square on any bar which is covered at high water; or

"(b.) A strip of land two hundred and fifty feet long at high-water mark, and in width extending from high-water mark to extreme low-water mark:

"In 'dry diggings' a claim shall be two hundred and fifty feet square."

The following provision is made for new discoveries of placer mining ground:—

"If any free miner, or party of free miners, discovers a new locality for the prosecution of placer-mining and such discovery be established to the satisfaction of the Gold Commissioner, placer claims of the following sizes shall be allowed to such discoverers, viz.:—



Tetnehuck Falls, Omineca Mining Division.



Trail Crossing at Cheslinle River, Omineca Mining Division.

B.C. Bureau of Mines

"To one discoverer, one claim600 feet in length;

"To a party of two discoverers, two claims amounting together to....1,000 feet in length;

"And to each member of a party beyond two in number, a claim of the ordinary size only.

"The width of such claims shall be the same as ordinary placer claims of the same class: Provided that where a discovery claim has been established in any locality no further discovery shall be allowed within five miles therefrom, measured along the watercourses."

Every placer claim shall be as nearly as possible rectangular in form, and marked by four legal posts at the corners thereof, firmly fixed in the ground. On each of such posts shall be written the name of the locator, the number and date of issue of his free miner's certificate, the date of the location, and the name given to the claim. In timbered localities boundary-lines of a placer claim shall be blazed so that the posts can be distinctly seen, underbrush cut, and the locator shall also erect legal posts not more than 125 feet apart on all boundary-lines. In localities where there is no timber or underbrush, monuments of earth and rock, not less than 2 feet high and 2 feet in diameter at base, may be erected in lieu of the last-mentioned legal posts, but not in the case of the four legal posts marking the corners of the claim.

A placer claim must be recorded in the office of the Mining Recorder for the mining division within which the same is situate, within fifteen days after the location thereof, if located within ten miles of the office of the Mining Recorder by the most direct means of travel. One additional day shall be allowed for every ten miles additional or fraction thereof. The number of days shall be counted inclusive of the days upon which such location was made, but exclusive of the day of application for record. The application for such record shall be under oath and in the form set out in the Schedule to the Act. A claim which shall not have been recorded within the prescribed period shall be deemed to have been abandoned.

To hold a placer claim for more than one year it must be rerecorded before the expiration of the record or rerecord.

A placer claim must be worked by the owner, or some one on his behalf, continuously, as far as practicable, during working hours. If work is discontinued for a period of seventy-two hours, except during the close season, lay-over, leave of absence, sickness, or for some other reason to the satisfaction of the Gold Commissioner, the claim is deemed abandoned.

Lay-overs are declared by the Gold Commissioner upon proof being given to him that the supply of water is insufficient to work the claim. Under similar circumstances he has also the power to declare a close season, by a notice in writing and published in the Gazette, for all or any claims in his district. Tunnel and drain licences are also granted by him on the person applying giving security for any damage that may arise. Grants of right-of-way for the construction of tunnels or drains across other claims are also granted on payment of a fee of \$25, the owner of the claim crossed having the right for tolls, etc., on the tunnel or drain which may be constructed. These tolls, however, are, so far as the amount goes, under the discretion of the Gold Commissioner.

Co-owners and Partnerships.

In both the "Mineral" and "Placer-mining" Acts provision is made for the formation of mining partnerships, both of a general and limited liability character. These are extensively taken advantage of and have proved very satisfactory in their working. Should a co-owner fail or refuse to contribute his proportion of the expenditure required as assessment work on a claim he may be "advertised out," and his interest in the claim shall become vested in his co-owners who have made the required expenditure, *pro rata* according to their former interests. It should not be forgotten that if any co-owner permit his free miner's certificate to lapse, the title of his associates is not prejudiced, but his interest reverts to the remaining co-owners.

Hydraulic and Dredging Leases.

Leases of unoccupied Crown lands may be granted by the Lieutenant-Governor in Council upon recommendation of the Gold Commissioner of the district, after location, by placing a legal post at each corner of the ground applied for. On the post nearest the placer-ground then being worked the locator must post a notice stating the name of the applicant, the location of the ground to be acquired, the quantity of ground, and the term for which the lease is to be applied for. Within thirty days application must be made in writing to the Gold Commissioner, in duplicate, with a plan of the ground on the back, and the application must contain the name of each applicant, the number of each applicant's free miner's certificate, the locality of the ground, the quantity of ground, the terms of the lease desired, and the rent proposed to be paid. A sum of \$20 must accompany the application, which is returned if the application is not granted. The term of leases must not exceed twenty years. The extent of ground covered by leases is not in excess of the following: Creek, half a mile; hydraulic diggings, 80 acres; for dredging leases, 5 miles; precious-stone diggings, 10 acres. Under Order in Council, the minimum rental for a creek lease is \$75 per annum and for a hydraulic lease \$50 per annum, with a condition that at least \$1,000 per annum shall be spent in development. For dredging leases the usual rental is \$50 per mile per annum; development-work worth \$1,000 per mile per annum must be done.

Taxation of Mines.

Mineral or placer claims, when Crown granted, are subject to a tax of 25 cents per acre, payable on June 30th annually, but if \$200 is spent in work in the year preceding that date, this tax is not levied. A tax of 2 per cent. is levied quarterly on all ores and other mineral substances mined in the Province, based upon the net value of such ore at the mouth of the shaft or tunnel, but where ore-producing mines produce under \$5,000 in a year half the tax is refunded, while placer or dredging mines that do not produce a gross value of \$2,000 in a year are entitled to a refund of the whole tax. These taxes are in substitution for all taxes on the land and for the taxes upon the personal property used in or the income derived from a working of the mines, so long as the land is only used for mining purposes. By the "Land Act" a royalty of 50 cents per M. board-measure, is levied on timber suitable for mining-props, a cord of props being considered as 1,000 feet board-measure.

Coal and Petroleum Prospecting Licences.

Any person desiring to prospect for coal, petroleum, or natural gas upon any unreserved lands held by the Crown may acquire a licence to do so over a rectangular block of land not exceeding 640 acres, of which the boundaries shall run due north and south and east and west, and no side shall exceed 80 chains (one mile) in length. Before entering into possession of the said land he shall place at the corner of such block a legal stake, or initial post, and shall inscribe thereon his name and the angle represented by such post, thus: "A. B.'s N.E. corner," or as the case may be, and shall keep posted for thirty days in a conspicuous place upon the said land, and also in the Government office of the district, as well as publishing it in the British Columbia Gazette and in a local newspaper for a like period, a notice of his intention to apply for such prospecting licence.

The applications for said licence shall be in writing, in duplicate, and shall contain the best written description possible, with a diagram of the land sought to be acquired, and shall be accompanied with a fee of \$100. The application shall be made to the Commissioner of Lands for the district, and by him forwarded to the Minister of Lands, who shall grant such licence—provided no valid protest is substantiated—for a period not to exceed one year, and at the expiration of the first year an extension of such licence may be granted for a second or third year.

Should the licensee discover coal, petroleum, or natural gas upon such land during the period of his licence, and produce satisfactory evidence, under oath, of the fact, he may obtain from the Lieutenant-Governor in Council, after having had the land properly surveyed, a lease of the said block for a term of five years, at an annual rental of 15 cents an acre, and such lease may be renewed for a further period of three years, upon the payment of a renewal fee of \$100, for each parcel of 640 acres of land; and if during the term of such lease, or within three months thereafter, he can show conclusively that he has continuously and vigorously prosecuted the work of coal or petroleum mining, and has fully carried out the terms of such lease, he shall be entitled to purchase the said lands, including the coal, petroleum, or natural gas thereunder, at the rate of \$20 an acre, or in the event of the surface rights having been alienated from the Government, he can purchase the coal, petroleum, or natural gas underlying such lands at the rate of \$15 an acre: Provided also that, in addition to the rental or purchase price, there shall be paid to the Government as a royalty $2\frac{1}{2}$ cents a barrel (35 Imperial gallons) of crude petroleum raised or gotten from such land. (See chapter 159, Revised Statutes, 1911, and chapter 44, 1913.)

Mining Recorders in Outlying Districts.

Where mineral is discovered in a part of the Province remote from Mining Recorders' offices, so that the provisions of the Act cannot be justly enforced, the miners themselves may, by a two-thirds vote at a meeting for that purpose, appoint a Mining Recorder from among themselves. Such Recorder can issue free miners' certificates, records of mining property, etc., and such entries will be valid notwithstanding any informality. Under the Act such Mining Recorder shall, as soon as possible, forward a list of the free miners' certificates issued by him, and of records made, to the nearest Gold Commissioner or Mining Recorder, together with the fees required by the law therefor.

Table of Fees.

Individual free miner's certificate	\$ 5 00
Company free miner's certificate (capital, \$100,000 or less)	50 00
Company free miner's certificate (capital, over \$100,000)	100 00
Recording mineral or placer claim	2 50
Recording certificate of work, mineral claim	2 50
Rerecord of placer claim	2 50
Recording lay-over	2 50
Recording abandonment, mineral claim	10 00
Recording abandonment, placer claim	2 50
Recording any affidavit under three folios	2 50
Per folio, over three, in addition	30
Records in "Record of Conveyances," same as affidavits.	
Filing documents	1 00
For Crown grant of mineral rights under "Mineral Act"	25 00
For Crown grant of surface rights of mineral claim under "Mineral Act"	10 00
For every lease under "Placer-mining Act"	5 00

SUMMARY OF SPECIAL ACTS RELATING TO MINING PASSED DURING SESSION OF 1916 AND 1917.

(The complete Acts may be obtained from the King's Printer, Victoria, B.C.)

Allied Forces Exemption Act and Amendments.

All free miners' certificates held by members of the Allied Forces shall, without further payment, remain in force until May 31st, 1918.

Assessment-work on all mineral claims held under the provisions of the "Mineral Act" by any member of the Allied Forces shall be deemed to have been done from the time of one month prior to the declaration of war, and thereafter continuously until March 6th, 1918.

All placer-mining claims and leases held under the "Placer-mining Act" by members of the Allied Forces shall be laid over continuously from one month prior to the declaration of war until March 6th, 1918.

The Lieutenant-Governor in Council is empowered to grant relief in cases where undue hardship may result to members of the Allied Forces through the strict enforcement of the mining laws of the Province.

Mines Development Act.

When it is shown to the satisfaction of the Minister of Mines that ore-bodies exist in quantity and of commercial value sufficient to warrant the expenditure of public moneys, the Minister of Mines may authorize the expenditure of so much of the public money as may be required for the construction of trails, roads, and bridges to facilitate the operation and development of such mineral or placer claims.

Furthermore, the Minister of Mines may authorize the expenditure of public money towards the building of trails and bridges in or to any mineral district for the purpose of facilitating the exploration of the mineral resources of the district, such expenditure not to exceed 50 per cent. of the cost of construction. If such roads, trails, or bridges have been built by any person or company having mining interests in the district, the Minister of Mines may refund to such persons a portion, not exceeding 50 per cent., of the cost of such construction.

The sum of \$200,000 was appropriated for the purposes of this Act.

Taxation Act Amendment Act, 1916.

A preliminary note is essential to the understanding of this Act. As the law has stood, a Crown-granted mineral claim on which taxes were in arrears for a number of years was offered for sale by the Government at a regular *tax sale*, with arrears of taxes plus interest and charges and Crown-grant fee as an upset price. If no sale was made the property remained in the hands of the Assessor until desired by some one, when it could only be purchased by tender. It was not open to location under the "Mineral Act" and a prospector had no protection, and to relieve the situation this Act was passed.

Under the new Act such reverted Crown-granted mineral claim may be obtained by any person under a lease for one year upon payment of \$25, and a renewal of such lease may be granted for a further period of one year, but no longer. During the period of such lease the lessee has the right to enter, prospect, and mine on such mineral claim, and during such time the lessee has the option to purchase such Crown-granted mineral claim upon payment of all taxes, costs, and interest which remained due and unpaid on such claim on the date of its forfeiture to the Crown, together with all taxes and interest from the date of the lease to the date of application to purchase the Crown grant.

A person may only obtain a lease, or any interest in a lease, of two such claims in the same Mining Division.

Such leases are not transferable and are subject to the rights any person may already hold to any portion of the surface of such Crown-granted mineral claim.

Mineral Survey and Development Act, 1917.

PART I.—MINERAL SURVEY.

A mineral survey of the Province has been established, to be carried on continuously and records thereof kept.

For this purpose the Province has been divided into six Mineral Survey Districts, to each of which districts a Resident Mining Engineer has been appointed, who shall devote his whole time to the carrying-out of the provisions of this Act and shall report to the Minister of Mines.

PART II.—AID TO PROSPECTORS.

The Resident Engineer in each district shall aid the prospectors, etc.; therein by such advice, information, and directions as may be of assistance to them; by examining and testing samples of mineral and advising as to same; by reporting as to such trails, roads, and bridges as may be desirable for the development of the mineral resources, with the approximate costs thereof.

The Minister of Mines may operate or cause to be operated diamond or other drills for prospecting purposes upon any lands or claims, either—

- (a.) Upon application of owner or lessee of any mineral claim:
- (b.) On recommendation of the Resident Engineer drilling may be done on any land and the cost thereof be apportioned as a charge against any or all properties which in the opinion of the Resident Engineer may be benefited by such drilling.

All such drilling shall be done upon the terms that the total cost of such drilling, together with a bonus equal to the total amount of such cost and interest at 6 per cent. per annum, shall be payable to the Minister of Mines, and as a debt due to the Crown shall be a first and paramount charge upon the claims or properties upon which or for which the work is done.

If the owner of a claim elects to pay in cash for such drilling, the cost price only will be charged and no bonus.

Every such Crown debt incurred as above shall be payable and recoverable in the manner following:—

- (a.) By taking 10 per cent. of any mineral mined or gotten from such claim or claims:
- (b.) By taking a sufficient portion of the purchase price on any sale of the premises charged with such Crown debt, and a sale of such premises may only be made subject to the satisfaction of such Crown debt:
- (c.) By foreclosure or sale after five years from the date of the recording of such charge.

The holders of property liable for any part of such drilling costs shall be entitled to the fullest information of such work, but no information shall be given to other parties, not in interest, except so far as such information shall be incorporated in the mineral survey of the district.

PART III.—PROTECTION OF WAGE-EARNERS.

1. Every person giving a bond or option on any mining property shall insert therein a provision that, during the life of such bond or option, all free miners and wage-earners employed on or about such property shall be paid semi-monthly; and the person giving such bond or option shall be personally liable for the payment of all such wages, unless he shall have received from the Government Agent or Mining Recorder a letter stating that adequate security for all such wages has been given and lodged in the Government office.

2. Every person taking a bond or option to purchase any mining property shall furnish to the nearest Government Agent or Mining Recorder adequate security from time to time for the

payment of all wages semi-monthly, on the terms that, upon any default in such payment of all wages, such security may be realized upon by such Government Agent or Mining Recorder, and all such Government Agents are given full power to and shall realize upon the proper security lodged with them, and shall make payment of any such wages in default up to the amount realized from such security.

PART IV.—PROTECTION OF INVESTORS.

Each Resident Engineer shall, upon receiving notice of any advertised or solicited sale of shares in any company or in any claim or mine or mineral property whatsoever, upon statements or terms not in accordance with actual facts and conditions, notify the Minister of Mines, who upon investigation may, if found necessary, give such notices, either personal or public, as may be necessary to prevent any injury to investors; and every notice given under this section by the Minister of Mines shall be absolutely privileged.

MINERAL PRODUCTION OF BRITISH COLUMBIA.

METHOD OF COMPUTING PRODUCTION.

In assembling the output of the lode mines in the following tables, the established custom of this Bureau has been adhered to, viz.: The output of a mine for the year is considered that amount of ore for which the smelter or mill returns have been received during the year. This system does not give the exact amount mined during the year, but rather the amount credited to the mine on the company's books during such year.

For ore shipped in December the smelter returns are not likely to be received until February in the new year, or later, and have, consequently, to be carried over to the credit of such new year. This plan, however, will be found very approximate for each year, and ultimately correct, as ore not credited in one year is credited in the next.

In the lode mines tables, the amount of the shipments has been obtained from certified returns received from the various mines, as provided for in the "Inspection of Metalliferous Mines Act, 1897." In calculating the value of the products, the average prices for the year in the New York Metal Market have been used as a basis. For silver 95 per cent., for lead 90 per cent., and for zinc 85 per cent. of such market prices have been taken. Treatment and other charges have not been deducted, except that in copper the amount of metal actually recovered has been taken, thus covering loss in slags.

TABLE I.—TOTAL PRODUCTION FOR ALL YEARS UP TO AND INCLUDING 1916.

Gold, placer	\$ 74,620,103
Gold, lode	91,350,784
Silver	41,358,012
Lead	36,415,124
Copper	114,559,364
Zinc	7,212,759
Coal and coke	165,829,315
Building-stone, bricks, etc.	26,697,835
Miscellaneous minerals, etc.	517,419
Total ..	\$558,560,715

TABLE II.—PRODUCTION FOR EACH YEAR FROM 1852 TO 1916 (INCLUSIVE).

1852 to 1892 (inclusive)	\$ 81,090,069
1893	3,588,413
1894	4,225,717
1895	5,643,042
1896	7,507,956
1897	10,455,268
1898	10,906,861
1899	12,393,131
1900	16,344,751
1901	20,086,780
1902	17,486,550
1903	17,495,954
1904	18,977,359
1905	22,461,325
1906	24,980,546
1907	25,882,560
1908	23,851,277
1909	24,443,025
1910	26,377,066
1911	23,499,072
1912	32,440,800
1913	30,296,398
1914	26,388,825
1915	29,447,508
1916	42,290,462
Total	\$558,560,715

Table III. gives a statement in detail of the quantities and value of the different mineral products for the years 1914, 1915, and 1916. It has been impossible as yet to collect complete statistics regarding building-stone, lime, bricks, tiles, and other miscellaneous products, but such figures as it has been possible to secure are given in some detail in Table V.

TABLE III.
QUANTITIES AND VALUE OF MINERAL PRODUCTS FOR 1914, 1915, AND 1916.

	Customary Measure.	1914.		1915.		1916.	
		Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Gold, placer.....	Ounces.....		\$ 565,000	38,500	\$ 770,000	29,025	\$ 580,500
" lode.....	"	247,170	5,109,004	250,021	5,167,934	221,932	4,587,334
Silver.....	"	3,602,180	1,876,736	3,366,506	1,588,991	3,301,923	2,059,739
Lead.....	Pounds.....	50,625,048	1,771,877	46,503,590	1,939,200	48,727,516	3,007,462
Copper.....	"	45,009,699	6,121,319	56,918,405	9,835,500	65,379,364	17,784,494
Zinc.....	"	7,866,467	346,125	12,982,440	1,460,524	37,168,980	4,043,985
Coal.....	Tons, 2,240 lb.	1,810,967	6,338,385	1,611,129	5,638,952	2,084,093	7,294,325
Coke	" "	234,577	1,407,462	245,871	1,475,226	267,725	1,606,350
Miscellaneous pro- ducts.....			2,852,917	.....	1,571,181	.....	1,326,273
			\$26,388,825		\$29,447,508		\$42,290,462

TABLE IV.
OUTPUT OF MINERAL PRODUCTS BY DISTRICTS AND DIVISIONS.

NAMES.	DIVISIONS.			DISTRICTS.		
	1914.	1915.	1916.	1914.	1915.	1916.
CARIBOO DISTRICT.....				\$ 308,807	\$ 885,502	\$ 778,157
Cariboo Mining Division.....	\$ 166,500	\$ 217,500	\$ 162,000			
Quesnel "	37,000	86,000	20,000			
Omineca "	105,307	582,002	596,157			
CASSIAR DISTRICT.....				2,079,177	4,420,988	7,210,949
EAST KOOTENAY DISTRICT..				4,703,672	4,653,836	6,810,926
WEST KOOTENAY DISTRICT.....				6,311,205	7,308,793	9,101,905
Ainsworth Division.....	471,534	360,846	754,902			
Slocan and Slocan City "	1,780,936	2,455,462	3,761,091			
Nelson "	579,563	608,277	619,376			
Trail Creek "	3,456,610	3,865,284	3,935,836			
Other parts.....	22,562	18,924	30,700			
BOUNDARY-YALE DISTRICT.....				4,867,029	5,470,689	7,243,560
Osoyoos, Grand Forks & Green- wood Divisions.....	4,270,744	5,023,635	6,592,991			
Similkameen, Nicola, Vernon..	533,991	371,733	450,780			
Yale, Ashcroft, Kamloops.....	62,294	75,321	199,789			
LILLOOET DISTRICT.....				38,978	25,643	65,457
COAST DISTRICTS (Nanaimo, Al- berni, Clayoquot, Quatsino, Victoria, Vancouver).....				8,079,957	6,682,057	11,079,508
				\$26,388,825	\$ 29,447,508	\$42,290,462



Big Interior Basin, Alberni Mining Division.



Della Mine, Arrastra.

TABLE V.
MISCELLANEOUS PRODUCTS AND TOTALS OF PRODUCTION, 1916.

DISTRICT AND DIVISION.	Cement.	Lime and Lime-stone.	Building-stone.	Riprap.	Crushed Rock.	Sand and Gravel.	Pottery and Clay.	Fire, Face, and Red Brick.	Total Building Materials.	Miscellaneous Minerals.	Total Miscellaneous Products.	Total Output of Collieries.	Total of Metalliferous Minerals.	Totals for Divisions.	Totals for Districts.
CARIBOO	\$ 778,157
Cariboo	1,000	.....	1,000	1,000	1,000	.....	.....	4,000	.....	4,000	.....	158,000	162,000	.....
Quesnel	20,000	20,000	.....
Omineca	1,000	.....	1,000	.....	.....	2,000	.....	2,000	.....	596,157	596,157	.....
CASSIAR	7,210,949
Atlin	3,000	3,000	.....	356,066	359,066	.....
Liard-Stikine.....
Skeena, Portland C	26,000	2,000	1,000	1,000	1,000	.....	.....	31,500	13,022	44,522	.....	6,807,361	6,851,883	.....
Queen Charlotte
EAST KOOTENAY	6,810,926
Fort Steele.....	500	1,000	1,000	1,000	1,000	.....	.....	4,500	.....	4,500	3,296,702	3,428,993	6,750,195	.....
Windermere-Golden.	500	.....	1,000	1,000	1,000	.....	.....	3,500	.....	3,500	.....	77,231	80,731	.....
WEST KOOTENAY	9,101,905
Ainsworth	500	.....	.....	500	500	.....	.....	1,500	.....	1,500	.....	753,402	754,902	.....
Slocan & Slocan City	500	500	500	.....	.....	1,500	2,400	3,900	.....	3,757,191	3,761,091	.....
Nelson	1,000	1,000	1,000	1,500	1,500	.....	1,000	7,000	4,080	11,080	.....	608,296	619,376	.....
Trail Creek.....	2,000	1,000	5,000	10,000	10,000	.....	.....	28,000	.....	28,000	.....	3,907,836	3,935,836	.....
Other Divisions	500	.....	.....	1,000	1,000	.....	.....	2,500	.....	2,500	.....	28,200	30,700	.....
BOUNDARY-YALE	7,243,560
Grand Forks
Greenwood	53,000	.....	1,000	1,000	1,000	.....	1,000	57,000	1,020	58,020	.....	6,534,971	6,592,991	.....
Osoyoos.....
Similkameen	386,921	59,859	450,780	.....
Nicola	1,000	.....	1,000	1,000	1,000	.....	.....	4,000	.....	4,000	.....	.....	.....	.....
Vernon
Yale	1,000	.....	2,000	1,500	1,500	.....	288	6,288	.....	6,288	.....	193,501	199,789	.....
Ashcroft
Kamloops
LILLOOET	436,459	19,000	162,783	1,000	1,000	1,000	.....	.....	3,000	3,198	6,198	.....	59,259	65,457	65,457
COAST DISTRICT	1,143,265	.....	1,143,265	5,217,052	4,719,191	11,079,508	11,079,508
	436,459	106,000	167,783	228,731	44,542	58,500	90,277	167,261	1,299,553	26,720	1,326,273	8,900,675	32,063,514	42,290,462	42,290,462

TABLE VI.—PLACER GOLD.

Table VI. contains the yearly production of placer gold to date, as determined by the returns sent in by the banks and express companies, of gold transmitted by them to the mints, and from returns sent in by the Gold Commissioners and Mining Recorders. To these yearly amounts one-third was added up to the year 1878; from then to 1895 and from 1898 to 1909, one-fifth; and since then one-tenth, which proportions are considered to represent, approximately, the amount of gold sold of which there is no record. This placer gold contains from 10 to 25 per cent. silver, but the silver value has not been separated from the totals, as it would be insignificant.

YIELD OF PLACER GOLD TO DATE.

1858.....	\$ 705,000	1873.....	\$ 1,305,749	1888.....	\$ 616,731	1903.....	\$ 1,060,420
1859.....	1,615,070	1874.....	1,844,618	1889.....	588,923	1904.....	1,115,300
1860.....	2,228,543	1875.....	2,474,004	1890.....	490,435	1905.....	969,300
1861.....	2,666,118	1876.....	1,786,648	1891.....	429,811	1906.....	948,400
1862.....	2,656,903	1877.....	1,608,182	1892.....	399,526	1907.....	828,000
1863.....	3,913,563	1878.....	1,275,204	1893.....	356,131	1908.....	647,000
1864.....	3,735,850	1879.....	1,290,058	1894.....	405,516	1909.....	477,000
1865.....	3,491,205	1880.....	1,013,827	1895.....	481,683	1910.....	540,000
1866.....	2,662,106	1881.....	1,046,737	1896.....	544,026	1911.....	426,000
1867.....	2,480,868	1882.....	954,085	1897.....	513,520	1912.....	555,500
1868.....	3,372,972	1883.....	794,252	1898.....	643,346	1913.....	510,000
1869.....	1,774,978	1884.....	736,165	1899.....	1,344,900	1914.....	565,000
1870.....	1,336,956	1885.....	713,738	1900.....	1,278,724	1915.....	770,000
1871.....	1,799,440	1886.....	903,651	1901.....	970,100	1916.....	580,500
1872.....	1,610,972	1887.....	693,709	1902.....	1,073,140		
Total.....							\$74,620,103

TABLE VII.—PRODUCTION OF LODE MINES.

YEAR.	GOLD.		SILVER.		LEAD.		COPPER.		ZINC.		TOTAL VALUE.
	Oz.	Value.	Oz.	Value.	Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	
		\$		\$		\$		\$		\$	
1887.....			17,690	17,331	204,800	9,216					26,547
1888.....			79,780	75,000	674,500	29,813					104,813
1889.....			53,192	47,873	165,100	6,498					54,371
1890.....			70,427	73,948	Nil.	Nil.					73,948
1891.....			4,500	4,000	Nil.	Nil.					4,000
1892.....			77,160	66,935	808,420	33,064					99,999
1893.....	1,170	23,404	227,000	195,000	2,135,023	78,996					297,400
1894.....	6,252	125,014	746,379	470,219	5,662,523	169,875	324,680	16,234			781,342
1895.....	39,264	785,271	1,496,522	977,229	16,475,464	532,255	952,840	47,642			2,342,397
1896.....	62,259	1,244,180	3,135,343	2,100,689	24,199,977	721,384	3,818,556	190,926			4,257,179
1897.....	106,141	2,122,820	5,472,971	3,272,836	38,841,135	1,390,517	5,325,180	266,258			7,052,431
1898.....	110,061	2,201,217	4,292,401	2,375,841	31,693,559	1,077,581	7,271,678	874,781			6,529,420
1899.....	138,315	2,857,573	2,939,413	1,663,708	21,862,436	878,870	7,722,591	1,351,453			6,751,604
1900.....	167,153	3,453,381	3,958,175	2,309,200	63,358,621	2,691,887	9,997,080	1,615,289			10,069,757
1901.....	210,384	4,348,603	5,151,333	2,884,745	51,582,906	2,002,733	27,603,746	4,446,963			13,683,044
1902.....	236,491	4,888,269	3,917,917	1,941,328	22,536,381	824,832	29,636,057	3,446,673			11,101,102
1903.....	232,831	4,812,616	2,996,204	1,521,472	18,089,283	689,744	34,359,921	4,547,535			11,571,367
1904.....	222,042	4,589,608	3,222,481	1,719,516	36,646,244	1,421,874	35,710,128	4,578,037			12,309,035
1905.....	238,660	4,933,102	3,439,417	1,971,818	56,580,708	2,399,022	37,692,251	5,876,222			15,180,164
1906.....	224,027	4,630,639	2,990,262	1,897,320	52,408,217	2,667,578	42,990,488	8,288,565			17,484,102
1907.....	196,179	4,055,020	2,745,448	1,703,825	47,738,703	2,291,458	40,832,720	8,166,544			16,216,847
1908.....	255,582	5,282,880	2,631,389	1,321,483	43,195,733	1,632,799	47,274,614	6,240,249			14,477,411
1909.....	238,224	4,924,090	2,532,742	1,239,270	44,396,346	1,709,259	45,597,245	5,918,522	8,500,000	400,000	14,191,141
1910.....	267,701	5,533,380	2,450,241	1,245,016	34,658,746	1,386,350	38,243,934	4,871,512	4,184,192	192,473	13,228,731
1911.....	228,617	4,725,513	1,892,364	958,293	26,872,397	1,069,521	36,927,656	4,571,644	2,634,544	129,092	11,454,063
1912.....	257,496	5,322,442	3,132,108	1,810,045	44,871,454	1,805,627	51,456,537	8,408,513	5,358,280	316,139	17,662,766
1913.....	272,254	5,627,490	3,465,556	1,968,606	55,364,677	2,175,832	46,460,305	7,004,489	6,758,768	324,421	17,190,838
1914.....	247,170	5,109,004	3,602,180	1,876,736	50,625,048	1,771,877	45,009,699	6,121,319	7,866,467	346,125	15,225,061
1915.....	250,021	5,167,934	3,366,506	1,588,991	46,503,590	1,939,200	56,918,405	9,835,500	12,982,440	1,460,524	19,992,149
1916.....	221,932	4,587,334	3,301,923	2,059,739	48,727,516	3,007,462	65,379,364	17,784,494	37,168,980	4,043,985	31,483,014
To'l	4,430,226	91,350,784	73,409,324	41,358,012	886,879,502	36,415,124	717,505,675	114,559,364	85,453,671	7,212,759	290,896,043

TABLE VIII.—COAL AND COKE PRODUCTION PER YEAR TO DATE.

COAL.		
Year.	Tons (2,240 lb.).	Value.
1836-1881.....	1,873,907.....	\$ 6,003,245
1882.....	282,139.....	846,417
1883.....	213,299.....	639,897
1884.....	394,070.....	1,182,210
1885.....	265,596.....	796,788
1886.....	326,636.....	979,908
1887.....	413,360.....	1,240,080
1888.....	489,301.....	1,467,903
1889.....	579,830.....	1,739,490
1890.....	678,140.....	2,031,420
1891.....	1,029,097.....	3,087,291
1892.....	826,335.....	2,479,005
1893.....	978,294.....	2,934,882
1894.....	1,012,953.....	3,038,859
1895.....	939,654.....	2,818,962
1896.....	896,222.....	2,688,666
1897.....	842,854.....	2,648,562
1898.....	1,135,865.....	3,407,595
1899.....	1,306,324.....	3,918,972
1900.....	1,439,595.....	4,318,785
1901.....	1,460,331.....	4,380,993
1902.....	1,397,394.....	4,192,182
1903.....	1,168,194.....	3,504,582
1904.....	1,253,628.....	3,760,884
1905.....	1,384,312.....	4,152,936
1906.....	1,517,303.....	4,551,909
1907.....	1,800,067.....	6,300,235
1908.....	1,677,849.....	5,872,472
1909.....	2,006,476.....	7,022,666
1910.....	2,800,046.....	9,800,161
1911.....	2,193,062.....	7,675,717
1912.....	2,628,804.....	9,200,814
1913.....	2,137,483.....	7,481,190
1914.....	1,810,967.....	6,338,385
1915.....	1,611,129.....	5,638,952
1916.....	2,084,093.....	7,294,325
Total.....	44,894,609	\$145,440,340

COKE.		
Year.	Tons (2,240 lb.).	Value.
1895-97.....	19,396.....	\$ 96,980
1898 (estimated).....	35,000.....	175,000
1899.....	34,251.....	171,255
1900.....	85,149.....	425,745
1901.....	127,081.....	635,405
1902.....	128,015.....	640,075
1903.....	165,543.....	827,715
1904.....	238,428.....	1,192,140
1905.....	271,785.....	1,358,925
1906.....	199,227.....	996,135
1907.....	222,913.....	1,337,478
1908.....	247,399.....	1,484,394
1909.....	258,703.....	1,552,213
1910.....	218,029.....	1,308,174
1911.....	66,005.....	396,030
1912.....	264,333.....	1,585,998
1913.....	286,045.....	1,716,270
1914.....	234,577.....	1,407,462
1915.....	245,871.....	1,475,226
1916.....	267,725.....	1,606,350
Total.....	3,615,465	\$20,388,975

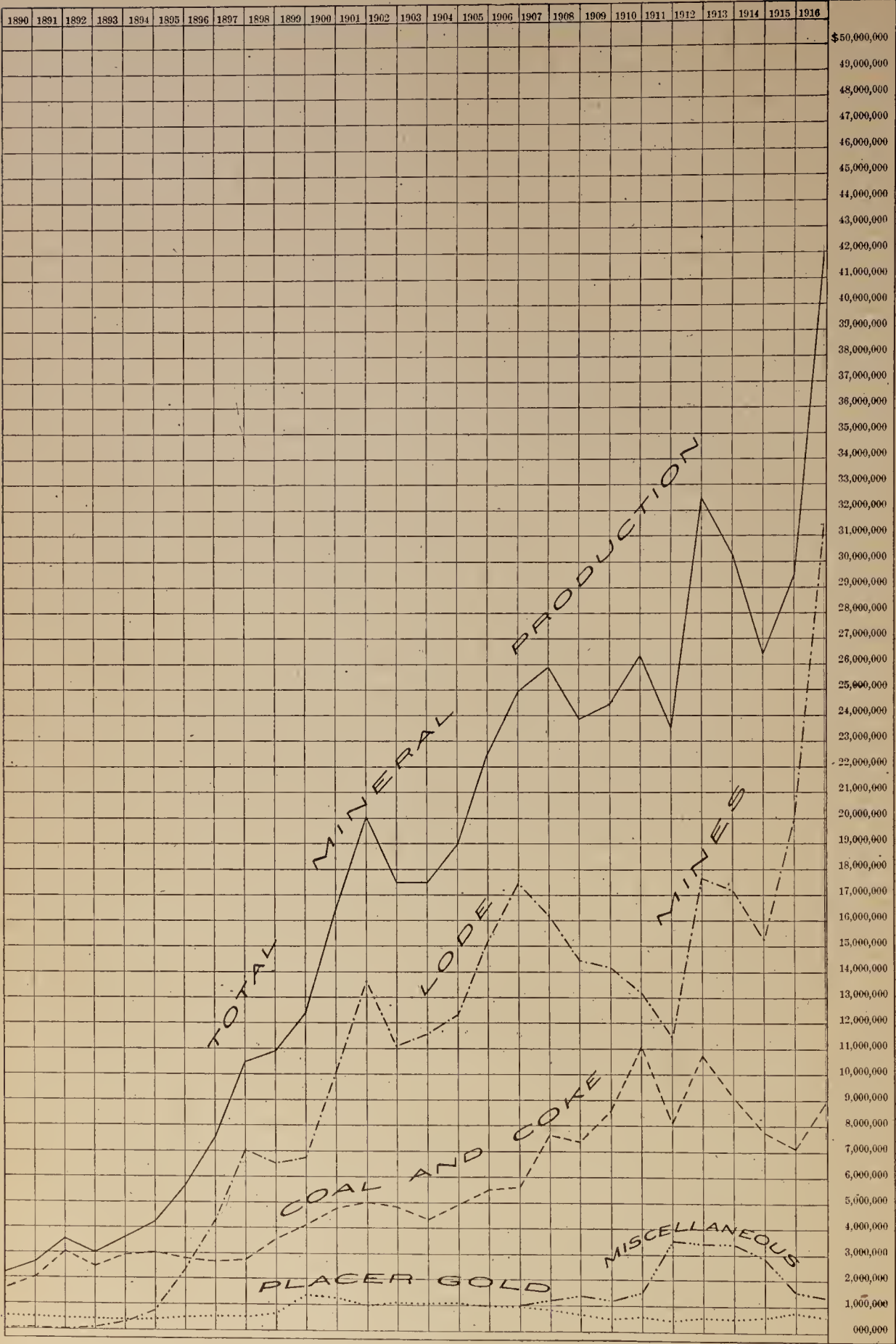
TABLE IX.—PRODUCTION IN DETAIL OF THE

DISTRICT.	YEAR	TONS.	GOLD—PLACER.		GOLD—LODE.		SILVER.	
			Ounces	Value.	Ounces	Value.	Ounces	Value.
				\$		\$		\$
Cariboo.....	1913		6,550	131,000				
Cariboo Division	1914		8,250	165,000				
	1915		10,750	215,000				
	1916		7,900	158,000				
Quesnel "	1913		1,500	30,000				
	1914		1,750	35,000				
	1915		4,250	85,000				
	1916		1,000	20,000				
Omineca "	1913	353	300	6,000	62	1,281	46,298	26,297
	1914	850	300	6,000	203	4,196	135,265	70,473
	1915	17,545	600	12,000	1,524	31,501	79,155	37,361
	1916	17,752	850	17,000	1,303	26,933	112,635	70,262
Cassiar	1913							
Atlin Division	1914	310	15,750	315,000	1,355	28,008		
	1915	270	16,100	322,000	1,000	20,670		
	1916	320	18,850	377,000	875	18,086		
	1916	262	16,925	338,500	736	15,213	3,054	1,905
Liard, Stikine, Skeena, Queen Charlotte, Portland Canal Divisions.	1913	51	650	13,000	29	599	4,714	2,678
	1914	261,987	1,150	23,000	2,884	59,612	131,509	68,516
	1915	646,391	1,450	29,000	5,034	104,053	175,179	82,684
	1916	732,880	1,100	22,000	3,806	78,670	256,802	160,193
East Kootenay	1913							
Fort Steele Division	1914	32,626	100	2,000			362,311	205,793
	1915	36,334	50	1,000			492,080	256,374
	1916	44,372	750	15,000			481,258	227,154
Windermere-Golden	1916	98,846	200	4,000			509,693	317,946
	1913	10,000					4,756	2,701
	1914							
	1915	5,556					1,188	561
	1916	2,183					29,178	18,201
West Kootenay	1913							
Ainsworth Division	1914	92,472			25	517	447,015	253,905
	1915	66,441			100	2,067	329,586	171,714
	1916	42,630			121	2,501	289,565	136,675
	1916	77,841			45	930	321,202	200,366
Slocan and Slocan City	1913	116,206			252	5,209	1,841,226	1,045,816
	1914	104,510			13	269	1,775,975	925,283
	1915	114,292			26	537	1,812,550	865,524
	1916	123,886			64	1,323	1,480,571	923,580
Nelson Division	1913	79,543	50	1,000	26,324	544,117	129,011	73,278
	1914	57,879			15,298	316,210	150,268	78,290
	1915	23,634	50	1,000	9,233	190,846	9,405	4,439
	1916	20,695	50	1,000	4,107	84,891	32,547	20,303
Trail Creek Division	1913	253,870			137,004	2,831,873	109,585	62,244
	1914	297,260			138,568	2,864,201	136,185	70,952
	1915	338,568			142,595	2,947,439	159,584	75,324
	1916	308,924			129,750	2,682,759	132,080	82,331
Revelstoke, Trout Lake and Lardeau	1913	546	100	2,000	54	1,116	23,397	13,289
	1914	149	100	2,000	8	165	11,295	5,885
	1915	155	100	2,000	15	310	16,740	7,901
	1916	521	50	1,000	22	455	22,419	13,985
Boundary-Yale	1913							
(Grand Forks, Greenwood and Osoyoos Divisions.)	1914	1,844,795	50	1,000	101,195	2,091,701	394,048	223,819
	1915	1,093,229	50	1,000	84,908	1,775,048	347,981	181,298
	1916	1,228,724	100	2,000	87,870	1,816,273	273,795	129,231
	1916	1,343,853	50	1,000	75,628	1,583,231	280,578	175,025
Similkameen, Nicola, and Vernon Divisions...	1913	54	150	3,000	1	20	335	190
	1914	150	150	3,000	35	724	15	8
	1915	225	600	12,000	101	2,088	347	164
	1916	1,416	450	9,000	32	661	830	518
Yale, Ashcroft and Kamloops Divisions	1913	557	100	2,000	25	517	126	72
	1914	279	150	3,000	14	289	57	30
	1915	2,134	500	10,000	106	2,191	1,702	803
	1916	7,414	150	3,000	570	11,782	4,215	2,629
Lillooet	1913							
Lillooet and Clinton Divisions	1914	840	150	3,000	1,368	28,277	295	168
	1915	120	150	3,000	231	4,775	390	203
	1916	50	400	8,000	31	641	5	2
	1916	2,400	250	5,000	2,625	54,259		
Coast	1913							
(Nanaimo, Alberni, Clayoquot, Quat- sino, New Westminster, Vancouver, and Victoria Divisions.)	1914	231,286	50	1,000	4,560	94,255	102,739	58,356
	1915	256,463	50	1,000	3,908	80,778	91,574	47,710
	1916	225,454	100	2,000	2,490	51,468	66,033	31,168
	1916	449,992	50	1,000	3,204	66,227	116,119	72,435
TOTALS	1913	2,663,809	25,500	510,000	272,254	5,627,490	3,465,856	1,968,606
	1914	2,176,971	28,250	565,000	247,170	5,109,004	3,602,180	1,876,736
	1915	2,690,110	38,500	770,000	250,021	5,167,934	3,366,506	1,588,991
	1916	3,183,865	29,025	580,500	221,932	4,587,334	3,301,923	2,059,739

METALLIFEROUS MINES, ETC., FOR 1913, 1914, 1915, AND 1916.

LEAD.		COPPER.		ZINC.		TOTALS FOR DIVISIONS.				TOTALS FOR DISTRICTS.
Pounds.	Value.	Pounds.	Value.	Pounds.	Value.	1913.	1914.	1915.	1916.	1916.
	\$		\$		\$	\$	\$	\$	\$	\$
						131,000				772,157
							165,000			
								215,000		
						30,000			158,000	
							35,000			
								85,000		
									20,000	
156,862	6,165	1,838	281			40,024				
323,482	11,322	6,000	816				92,807			
249,279	10,395	2,831,279	489,245					580,502		
224,451	13,853	1,646,072	447,764	168,616	18,345				594,157	7,163,427
						343,008				
							342,670			
								395,086		
7,260	448								356,036	
6,579	259	1,336	204			16,740				
		11,123,376	1,512,779				1,663,907			
30,462	1,270	21,915,481	3,786,995					4,004,002		
1,077	66	24,065,995	6,546,432						6,807,361	3,503,224
18,525,083	728,036					935,829				
24,863,105	870,209						1,127,583			
26,582,050	1,108,472			180,000	20,250			1,370,876		
24,156,143	1,490,917	5,654	1,533	14,840,000	1,614,592				3,428,993	
2,495,355	98,067					100,768				
216,327	9,021			311,719	35,068			44,650		
571,244	35,257	3,400	925	210,000	22,848				77,231	9,054,925
9,027,861	354,795			150,680	7,233	616,450				
8,069,525	282,433			280,000	12,320		468,534			
3,436,184	143,289			678,940	76,381			358,846		
7,841,869	484,000			625,971	68,103				753,402	
22,648,766	890,096			6,608,088	317,188	2,258,309				
15,233,910	533,187			7,254,464	319,197		1,777,936			
14,925,345	622,387			8,684,572	977,014			2,455,462		
14,415,645	889,734			17,854,357	1,942,554				3,757,191	
1,936,418	76,101	815,126	124,470			818,966				
2,004,436	70,155	586,764	79,800	332,003	14,608		559,063			
967,775	40,356	30,240	5,225	3,127,209	351,811			593,677		
1,240,784	76,582	176,333	47,980	3,470,036	377,540				608,236	
		2,538,661	387,654			3,281,771				
		3,779,830	514,057				3,449,210			
		4,651,681	803,811					3,826,574		
		4,200,745	1,142,686						3,907,836	
521,771	20,506					36,911				
128,912	4,512						12,562			
89,041	3,713							13,924		
203,741	12,760								28,200	6,788,331
45,932	1,807	28,621,973	4,370,575			6,688,902				
1,678	59	16,428,959	2,234,339				4,171,744			
7,127	297	17,402,662	3,007,180					4,954,981		
14,922	921	17,626,623	4,794,794						6,534,971	
		8,073	1,233			4,443				
							3,732			
		21,701	3,750					18,002		
		182,633	49,680						59,859	
		29,505	4,505			7,094				
		14,525	1,975				5,294			
		295,164	51,004					63,998		
47,380	2,924	633,594	173,166						193,501	59,259
						31,445				
							7,978			
								8,643		
									59,259	4,719,191
		14,443,793	2,205,567			2,359,178				
		13,070,245	1,777,553				1,907,041			
		9,770,197	1,688,290					1,772,926		
		16,835,265	4,579,529						4,719,191	
55,364,677	2,175,832	46,460,305	7,094,489	6,758,768	324,421	17,700,838				
50,622,048	1,771,877	45,009,699	6,121,319	7,866,467	346,125		15,790,061			
46,503,590	1,939,200	56,918,405	9,835,509	12,982,440	1,460,524			20,762,149		
48,727,516	3,007,462	65,379,364	17,784,494	37,168,980	4,043,985				32,063,514	32,063,514

TABLE X.—SHOWING MINERAL PRODUCTION OF BRITISH COLUMBIA.



PROGRESS OF MINING.

The gross value of the mineral production for 1916 was \$42,290,462, an increase over that of the year 1915 of \$12,842,954, or nearly 44 per cent., and an increase over that of the previous record year 1912 of \$9,849,662, or 30.3 per cent. The gross value of the metallic minerals recovered in 1916 was \$32,063,514, which represents an increase over last year of \$11,301,365, a percentage increase of about 54 per cent. which is certainly a matter for congratulation. It might be further pointed out that the metalliferous output for 1916 was the greatest in the history of mining in the Province, being nearly 76 per cent. greater than the year of 1912.

This increased value of the metalliferous output is due in part to the higher market prices of the metals during the year, and in part to the much larger production of some metals, notably copper and zinc.

The production of copper was 8,460,959 lb. more than the previous record year (1915), or 14.85 per cent., while the zinc-output was three times in quantity that of the previous year.

It is to be noted that this past year the value of the copper-output was practically 50 per cent. of that of the gross metalliferous production of the Province.

The year 1916 was a record year for mining in British Columbia, all branches of the industry, excepting gold and the building materials, showing increased production over that of the previous year. The uncertainty of war conditions during 1915 was not such a prominent feature in 1916, and steady operations were general throughout the year.

The continued enormous and ever-increasing demand for shells of all kinds for the Allies has continued the great consumption of copper, lead, and zinc, with the result that the market prices of these metals remained at an abnormally high level all year.

During the last half of 1915 the market prices of metals were high, but, as it was thought these prices might drop at any time, the main stimulating effect on mining was only to increase production at the existing mines and did not cause much development of new properties. With, however, the continuation of these high prices and the predictions by many eminent authorities that at least reasonably high metal prices might be expected to continue for some time, the year 1916 saw a great increase of new development.

All over the Province old properties which had been abandoned, or closed, were re-examined and in many instances work commenced and ore shipments made. Along the Coast a number of copper prospects which have lain dormant for years have been taken up under options and work on them started. Capital for these new enterprises is being obtained in Vancouver, Victoria, Spokane, Edmonton, and, of course, from the large moneyed centres of the United States.

Owing to the fact that so many men in the Province have enlisted, the problem of getting sufficient labour has often been serious, and there is no doubt that with ample labour a still larger production would have been made. Prospecting has suffered more than mining, as the prospectors as a class have responded very readily to the recruiting sergeant, with the result that prospecting has been practically at a standstill. Furthermore, the high wages being paid at the mines has retained many who might otherwise have engaged in prospecting during the summer-time. A great need for the future of the mining industry is a large influx of prospectors to the Province, and it may confidently be expected that the free and adventurous life of prospecting will make a strong appeal to many of the returned soldiers.

The outputs from metal-mining and coal-mining are intimately related to one another, as any increase in production from the former causes an increased production from the latter for fuel for smelting, power, and transportation purposes. As might be expected, then, with a largely increased production of metalliferous minerals in 1916, there is also an increased output of coal and coke. On the other hand, a stoppage of production of coal and coke immediately curtails the metalliferous production.

Had it not been that the Crowsnest Collieries, through a series of mishaps—accompanied by a serious shortage of labour due to the war, followed by a labour strike—were unable to

make as large an output as expected and intended, the coal and coke production would have been much greater; but as it was, there resulted such a shortage of coke as to partially close the copper-smelters, and these in turn compelled the copper-mines to very much curtail their outputs.

But for these untoward circumstances it is certain that the output for 1916 would have approached the \$50,000,000 mark.

A portion of the coal-output is used for domestic purposes and in industrial plants, and a decline in demand for fuel for these purposes partly offset the increase due to increased metalliferous production.

The production of building materials shows a slight decrease as compared with the previous year, which reflects the continued depression in the building trades.

Taken in the aggregate, the mineral production and development in the year 1916 is cause for congratulation at this time, and it may confidently be expected that the future will show a steady increase. The industry is now in a healthy condition and promises well for the future.

Details of the market prices of metals will be found under the discussion of each metal, but it may be noted here that the rise in silver from an average of 50 cents an ounce in 1915 to over 75 cents at the close of the year 1916 proved very beneficial to the silver-lead mines of the Slocan.

The year 1916 saw some important metallurgical developments in British Columbia. The most important of these was the completion and commencement of operations at the electrolytic zinc plant of the Consolidated Company at Trail near the beginning of the year. The plant was operated steadily during the remainder of the year and is now turning out from 25 to 30 tons of spelter a day. The output for 1916 was approximately 15,000,000 lb. In connection with this plant sulphuric acid and hydrofluosilic acid plants were erected.

The commencement of electrolytic copper-deposition process in the Province was also started at Trail during the year. The refinery installed has a capacity of 10 tons of cathode copper a day, and is now being increased to 15 tons a day. In addition to copper produced by the Consolidated Company some blister-copper from the British Columbia Copper Company is also being refined at this plant.

Late in the year the Ladysmith smelter, which has lain idle since 1911, was purchased from the Tyee Copper Company by the Ladysmith Smelting Corporation, Ltd., backed by Ohio capital. It is expected that the smelter will be ready to operate some time in the near future. A general custom smelting business is to be carried on, and in addition the company expects to obtain ore from its own properties.

Several new concentrating plants have been under construction during the year and some of these were completed. Of these the most important were the *Florence* mill at Ainsworth, the *Surprise* mill, Slocan, and the mill at the Surf Inlet property, Princess Royal island.

During the year considerable increases were made in the wage schedule paid to all labour employed in mining. As high metal prices prevailed, this worked no hardship on the operating mines, except in the case of gold-mines. Gold by remaining at a standard price has really declined considerably in value when measured in terms of labour and supplies, so that the gold-mines, by having higher operating expenses and no increase in the value of the finished product, have made lower profits than in former years.

The higher cost of labour and supplies—especially powder—has made the cost of new development very high, but in spite of this much work has been done.

All the large operating companies have had a satisfactory year, and, in addition to ore-extraction, development has been kept well ahead. The Britannia Company brought further milling capacity into operation during the year and is now treating 2,800 tons a day.

The gradual increase in production during the past twenty-six years, and its fluctuations, are graphically shown in Table X., on page 14 of this Report.

The tonnage of ore mined in the lode mines of the Province during the past year was greater than that of any previous year. The ore mined amounted to 3,188,865 tons, showing an increase over that of the previous year of 498,755 tons.

The tonnage mined in 1916 was produced by the various districts in about the following proportions: Boundary-Yale, 42.4 per cent.; Cassiar and Omineca, 23.5 per cent.; Coast District, 14.1 per cent.; Rossland, 9.7 per cent.; Slocan, 3.9 per cent.; East Kootenay, 3.2 per cent.; Ainsworth, 2.4 per cent.; Nelson, 0.7 per cent.; all others, 0.1 per cent.



Alice Arm Townsite.



Churn-drill, San Diego Group.

The following table shows the number of mines which shipped ore during the year 1916, the districts in which they are situated, and the tonnage produced in each district, together with the number of men employed, both above ground and underground.

In explanation of the table it should be said that, in its preparation, a mine employing twelve men for four months is credited in the table with four men for twelve months, so that the total given is less than the actual number of individuals who worked in the mines during the year.

TABLE SHOWING DISTRIBUTION OF SHIPPING MINES IN 1916.

	Tons of Ore shipped.	No. of Mines shipping.	No. of Mines shipping over 100 Tons in 1916.	MEN EMPLOYED IN THESE MINES.		
				Below.	Above.	Total.
CASSIAR DISTRICT:						
Atlin, Stikine, Queen Charlotte, and Portland Canal.....	2,063	9	3	39	40	79
Skeena.....	731,979	4	1	316	135	451
CARIBOO DISTRICT:						
Omineca.....	17,752	7	2	60	52	112
EAST KOOTENAY DISTRICT:						
Fort Steele.....	98,846	5	3	148	96	244
Windermere-Golden.....	2,183	9	5	38	29	67
WEST KOOTENAY DISTRICT:						
Ainsworth.....	77,841	18	7	197	151	348
Slocan and Slocan City.....	123,886	34	15	453	288	741
Nelson.....	20,695	14	11	151	64	215
Trail Creek.....	308,924	4	4	661	150	811
Revelstoke, Lardeau, and Trout Lake.....	521	6	1	22	17	39
BOUNDARY-YALE DISTRICT:						
Greenwood, Grand Forks, and Osoyoos.....	1,343,853	30	15	535	269	804
Similkameen, Nicola, and Vernon	1,416	7	1	16	19	35
Yale, Ashcroft, and Kamloops..	7,414	8	2	63	48	111
LILLOOET DISTRICT.....	2,400	3	3	17	28	45
SOUTHERN COAST DISTRICT.....	449,992	17	9	560	592	1,152
Total.....	3,188,865	169	81	3,276	1,978	5,254

In the following table of the non-shipping mines the returns are necessarily incomplete, as they include only the mines reporting to the Department, and not the prospects and properties under preliminary development, which in the aggregate give employment to a large number of men.

TABLE SHOWING NON-SHIPPING MINES AND MEN EMPLOYED.

DISTRICT.	NUMBER OF MINES.			MEN EMPLOYED.		
	Working.	Idle.	Total.	Below.	Above.	Total.
COAST AND CASSIAR.....	4	13	17	4	18	22
EAST KOOTENAY.....	.....	3	3	.....	.....	.....
AINSWORTH.....	3	6	9	9	7	16
SLOCAN.....	9	11	20	32	14	46
NELSON.....	2	7	9	8	2	10
TRAIL CREEK.....	1	6	7	4	3	7
REVELSTOKE-LARDEAU.....	4	1	5	7	.....	7
BOUNDARY.....	3	11	14	15	12	27
LILLOOET.....	1	1	2	2	2	4
Total.....	27	59	86	81	58	139

SUMMARY OF STATISTICAL TABLES.

Referring to the preceding tables of the mineral production of the Province, the following is a summary of their contents:—

TABLE I. shows the total gross value of each mineral product mined in the Province up to the end of 1916, aggregating \$558,560,715. From this table it will be seen that coal-mining has produced more than any other separate class of mining, a total of \$165,829,315; followed next in importance by copper at \$114,559,364, and next in order is lode gold at \$91,350,784, with placer gold in fourth place at \$74,620,103.

The metal gold, obtained from both placer and lode mining, amounts to a value of \$165,970,887, the greatest amount derived from any one mineral, the next important being coal, the total gross value of which, combined with that of coke, is \$165,829,315, followed by copper at \$114,559,364, silver at \$41,358,012, and lead at \$36,415,124.

TABLE II. shows the value of the total production of the mines of the Province for each year from 1893 to 1916 (inclusive), during which period the output increased tenfold, and reached a gross production for the year 1916 of \$42,290,462, which is \$12,842,954 greater than that of the year 1915, and nearly 40 per cent. greater than the previous record year, certainly a matter for congratulation.

The value of the total mineral production of the Province up to the end of 1916 was \$558,560,715.

TABLE III. gives the quantities in the customary units of measure, and the values, of the various metals or minerals which go to make up the total of the mineral production of the Province, and also, for the purposes of comparison, similar data for the two preceding years.

The table shows that there has been this year a decrease in the production of placer gold of \$189,500, and a decrease in the output of lode gold of \$580,600, making a total decrease of \$770,100 in the total production of the metal.

The amount of silver produced this year was 3,301,923 oz., having a gross value of \$2,059,739, a decrease in the number of ounces of 64,583, due principally to a decreased output in the Slocan and Trail Creek districts which was partially compensated by increases in all the other districts. The value of the silver production in 1916 was, however, \$470,748 greater than in 1915, due to the prevailing high market price of silver in 1916.

The table shows an output of lead in 1916 amounting to 48,727,516 lb., valued at \$3,007,462, which is an increase over the production of the preceding year of 2,223,926 lb. of lead, and an increase in value of \$1,068,262, partly due to the advance in the value of the metal.

The production of copper this year was 65,379,364 lb., valued at \$17,784,494, an increase in amount of 8,460,959 lb. or about 14.8 per cent. The value of the product was greater than that of the preceding year by \$7,948,994—an increase of slightly over 80 per cent.

TABLE IV. shows the proportions of the total mineral productions made in each of the various districts into which the Province is divided.

It will be noted that this year for the first time on record the Southern Coast District has the honour of first place on the list, followed, in order of importance, by the West Kootenay, Boundary, Cassiar, and East Kootenay Districts. The Coast and East Kootenay Districts owe a considerable proportion of their output to the coal-mines situated within their limits, whereas, in the other districts, the production is chiefly from metal-mining.

The Coast District also derives a fair proportion of its production from "Miscellaneous products," such as building materials, etc., due to the larger cities therein; this year this amounted to \$1,143,265, as shown in Table V.

TABLE V. is a new table introduced four years ago, and is an endeavour to show in some detail the production of those products, such as building materials, previously summarized under "Miscellaneous products," and which amounts this year to \$1,326,273. Much difficulty has been found in obtaining reliable figures regarding these products, and in many cases they have had to be estimated; but, while the figures regarding these products, and in many cases they have had to be estimated; but, while the figures are not as complete as desired, they are at least approximate, and show what an important branch of mineral production this has become, despite the falling-off due to the war and depressed financial conditions.

TABLE VI. shows the statistical record of the placer mines of the Province from 1858 to 1916, and shows a total production of \$74,620,103. The output for 1916 was \$580,500, a decrease, as compared with the previous year, of about 24.6 per cent.

TABLE VII. relates entirely to the lode mines of the Province, and shows the quantities and values of the various metals produced each year since the beginning, in 1887, of such mining in the Province. The gross value of the product of these mines to date is \$290,896,043; this figure includes the zinc production of 1909 and all subsequent years.

Lately a new column was made in this table in which to record the zinc production, and the output since 1909 has been recorded therein. In former years the zinc production was small and was listed as miscellaneous material.

TABLE VIII. contains the statistics of production of the coal-mines of the Province. The total amount of coal produced to the end of 1916 was 44,894,609 tons (of 2,240 lb.), worth \$145,440,340. Of this, there was produced in 1916 2,084,093 tons valued at \$7,294,325, an increase of 472,964 tons in quantity and of \$1,655,373 in value compared with the preceding year. In these figures of coal production the coal used in making coke is not included, as such coal is accounted for in the figures of output of coke. The amount of coal used in making coke in 1916 was 401,487 tons, from which was made 267,725 tons of coke, having a value of \$1,606,350, an increase in amount over the preceding year of 21,854 tons, or about 8.9 per cent., with an increase in value of \$131,124. The total value of the output of the collieries of the Province in 1916 was \$8,900,675.

The average selling prices taken this year in the calculation of value of product are the same as those used last year; that for coal being \$3.50 and for coke being \$6 a ton of 2,240 lb. The prices used in calculations prior to 1907 were \$3 and \$5 respectively.

More detailed statistics as to the coal production of the Province and of the separate districts are given elsewhere in this Report.

TABLE IX. gives the details of production of metalliferous mines of the Province for the years 1913, 1914, 1915, and 1916, and the districts in which such productions were made, showing the tonnage of ore mined in each district, with its metallic contents and its market value.

The total tonnage of ore mined in the Province during the year 1916 was 3,188,865 tons, having a gross value of \$31,483,014 and, with the placer gold, a total value of \$32,063,514.

The following table shows the percentages of such tonnage derived from the various districts of the Province:—

Boundary-Yale District	42.42	per cent. of tonnage.
Trail Creek Mining Division	9.68	” ”
Cassiar and Omineca Districts	23.50	” ”
Southern Coast District	14.12	” ”
Slocan District	3.88	” ”
Ainsworth Mining Division	2.44	” ”
Nelson Mining Division	0.65	” ”
East Kootenay District	3.16	” ”
Other Divisions	0.15	” ”

100.00

In reports previous to 1910 there has been included in this table the “Miscellaneous products,” and in 1910 these were shown distributed to the various districts; the great increase of these products in the past few years has rendered it advisable that this table be reserved exclusively for metalliferous products, and so a new table (No. V.) was introduced in 1911, giving in some detail, the output of these miscellaneous products.

In making comparisons of this table with similar tables in previous reports, the fact that “Miscellaneous” has been removed will have to be borne in mind.

TABLE X. presents in graphic form the facts shown in figures in the tables, and demonstrates to the eye the rapid growth of lode-mining in the Province, and also the fluctuations to which it has been subject.

It will be seen that, although coal-mining has been a constantly increasing industry during this whole period of twenty-six years, lode-mining did not begin practically, until 1894, since when it has risen with remarkable rapidity, though not without interruption, until it reached, in 1906, the \$17,500,000 line. The total mineral production in 1910 reached the \$26,000,000 line, and in 1912 it reached the \$32,000,000 line, while this year it is above the \$42,000,000 line.

GOLD.

The production of placer gold during the past year was worth about **Placer Gold.** \$580,500 as nearly as can be ascertained; great difficulty is found in obtaining reliable figures, since the work is, in many cases, carried out by individuals or unorganized groups of men who keep no books, frequently paying wages, or for supplies, in gold-dust, which, being readily transported, is scattered, and the tax imposed thereon by law is thus evaded.

This year's output shows a decrease, as compared with 1915, of \$189,500, chiefly due to a drier season than usual in the Atlin and Cariboo Districts.

The production of placer gold is nearly all from the Atlin and Cariboo Districts, about 95 per cent. of the total coming from these two sections.

Although this year shows a decreased output as compared with 1915, it is, nevertheless, greater than that of any other year since 1908.

In hydraulic mining it has been pretty well demonstrated that the gold-output is in direct proportion to the number of days in which water was available for piping; the snowfall of the winter of 1915-16 was unusually light, and, as this is the principal source of the water-supply, it was anticipated that the quantity of water available for hydraulicking would fall short of the usual quota; hence there was little hope for even a normal production of placer gold during the season of 1916.

In the Barkerville section of the Cariboo District the larger hydraulic companies made a smaller output than usual, due to an insufficient supply of water; this is also true of the Quesnel and Quesnel Forks sections, which report much smaller amounts of gold recovered than has been the rule for some years past.

Complete news has been received from the Omineca District, where considerable work has been going on, most of which, however, was of a preparatory nature, and it is not expected that any great output was made this year, probably not more than about \$17,000 all told.

In the Atlin District the shortage of water was very noticeable, some of the companies being so short as to be only able to work effectively for half the season. On the other hand, some of the companies were evidently working in richer ground; it is not known whether this was by good luck or by intentionally attacking only the richer parts, in an attempt to compensate for the water shortage.

In the Liard-Stikine District the Boulder Creek Hydraulic Mining Company had a successful season, taking out about \$17,000 from its ground on Thibert creek. Ball and Finn and Mitchell Bros., working in the same vicinity, made small outputs.

Four different partnerships were at work on Dease creek, with success enough to at least pay wages.

This year some gold was taken out of the Tahltan river by Indians and others working in the river-bed.

It is to be noted this year that two or three parties were working down the Liard river, at McDame creek, and on Rosella creek, a section that has been practically abandoned of late years.

Considerable work in connection with placer-mining was done in the Similkameen District, although the actual production was small. About \$1,700 worth of crude platinum was recovered and has been included in the placer output.

Vernon District also yielded some gold from hydraulic operations in Siwash creek.

Yale Mining Division made an unusually small output, considering the very low water in the rivers exposed the bars.

The Fort Steele Mining Division made a better output than for some years past.

The value of the gold produced from lode-mining in the Province during **Gold from** the year 1916 was \$4,587,334, a decrease, as compared with the previous year, **Lode-mining.** of \$580,600, or about 11.23 per cent. This smaller production of lode gold is due to a decreased tonnage of ore mined in the Rossland District and to slightly lower values in the gold contents of the Boundary ores.

It is encouraging to note an increased output from Lillooet District, which produced 2,625 oz., as compared with 31 oz. in 1915.

The only large stamp-mill in operation in the Province is at the *Nickel Plate* mine at Hedley. In the Osoyoos Mining Division, which, this past year, milled some 73,500 tons of ore having a

value of over \$700,000. There are smaller stamp-mills operating at the *Queen*, *Perrier*, *Granite*, and other mines in the Nelson Division; and, in addition, there are stamp-mills at the *Jewel* mine, Greenwood; *Coronation*, *Pioneer*, and *Lorne* mines, Lillooet; and *Engineer* mine, Atlin, which operated during the year.

The following are the values of the gold product of the three most important camps; Rossland, \$2,682,759; Boundary, \$1,563,231; and Nelson, \$84,891. Nearly 80 per cent. of the gold production of the Province is obtained from the smelting of copper-bearing ores, the remainder mainly from stamp-milling.

The gold production of the various districts is approximately as follows:—

	Oz.
Rossland	129,790
Boundary	76,230
Nelson	4,107
Skeena	3,806
Coast	3,204
Omineca	1,303
All others	3,492

The production in the Rossland District shows a decrease of 12,805 oz. as compared with 1915, which is accounted by a decrease in the tonnage shipped.

The Boundary District shows a decrease of 11,640 oz., as compared with 1915. The Granby Company's mines show a decrease of about 7,800 oz., but the British Columbia Copper Company shows a considerable increase; while the *Jewel* and the *Union* show decreases.

The *Nickel Plate* production was less than the previous year by nearly 8,000 oz. The other properties in this district only contribute small amounts. The *Carmi* did not operate, and little was done by the *Dividend-Lake View*.

A reduction of about 5,000 oz. occurred in the Nelson District, or over 50 per cent. This decrease is mainly due to a falling-off in the production of the *Mother Lode* mine on Sheep creek, where the cyanide-mill was not operated owing to the exhaustion of the developed ore reserves at the mine. The mine is at present closed and the future plans of the company are not known. The *Granite* mine made an increased production.

The *Queen* mine, on Sheep creek, made a smaller output than the previous year, but it is said that development-work on the lower levels is proving satisfactory in showing the continuation of the ore-shoots.

The production of gold from the Skeena District is practically all from the *Hidden Creek* mine, at Anyox. The tonnage mined at this property was greater, but the gold content was somewhat lower, than in 1915.

The Coast production shows an increase, due to increased tonnage from the *Britannia* and *Marble Bay* mines.

The Omineca production comes almost entirely from the *Rocher Déboulé* mine, near Hazelton, which is a new property that only commenced shipping last year. The ore is a high-grade copper ore, carrying low gold and silver values.

SILVER.

The total amount of silver produced in the Province during the year 1916 was 3,301,923 oz., valued at \$2,059,739, a decrease in amount, as compared with the previous year, of 64,583 oz.; but, owing to the increase in the market value of this metal, the value of the silver-output in 1916 was \$470,748 greater than in 1915.

Unlike the other metals, silver declined in price at first owing to the effect of the war on the market. The decline in the price of silver, followed by a sudden rise in value, is best seen by comparing the average yearly prices for the last three years, which were:—

1913	59.8 cents an oz.
1914	54.8 "
1915	49.7 "
1916	65.7 "

The market price steadily improved, starting at 56.8 cents in January and reaching 75.765 cents in December, 1916.

The increase in the price of silver was due to the large amounts being required by Great Britain, France, and Russia for coinage.

The Slocan District—including the Ainsworth, Slocan, Slocan City, and Trout Lake Mining Divisions—produced about 55 per cent. of the total Provincial output of silver this year, and the Fort Steele Mining Division about 15.4 per cent., all from argentiferous galena. The remainder is chiefly derived from the smelting of copper-ores carrying silver.

The following table shows the silver production from the different Mining Divisions:—

Slocan and Slocan City M.D. produced 1,480,571 oz. silver = 44.83 per cent. of total.

Fort Steele M.D. produced	509,693	„	15.43	„
Ainsworth	321,202	„	9.73	„
Bonndary	285,623	„	8.65	„
Skeena	256,802	„	7.77	„
Trail Creek	132,080	„	4.00	„
Omineca	112,635	„	3.41	„
Coast	116,119	„	3.52	„
Nelson	32,547	„	0.99	„
Trout Lake-Revelstoke M.D. produced	22,419	„	0.68	„
All others produced	32,232	„	0.99	„
	3,301,923		100.00	

LEAD.

The lead production of the Province for the year 1916 was 48,727,516 lb. of lead having a market value of \$3,007,462, showing, as compared with the previous year, an increase in amount of 2,223,926 lb. of lead, or 4.72 per cent.; but owing to the increase in the market value of this metal, the value of the lead-output in 1916 was \$1,068,262 greater than in 1915.

This amount of lead represents the amount of metallic lead actually received and paid for by the smelters.

Instead of taking account of “loss in slags,” we have followed, as has been our habit, the practice of the smelters of deducting 10 per cent. from the market price of the metal, in calculating the value.

The average market price of this metal for the year 1916 was considerably higher than for the previous year, being 6.858 cents a pound as compared with 4.6 cents.

The lead production is this year, as usual, derived chiefly from the Slocan and Fort Steele Mining Divisions, as is shown in the following table:—

Fort Steele M.D. produced 24,156,143 lb. lead = 49.57 per cent. of total.

Slocan	14,415,645	„	29.58	„
Ainsworth	7,841,869	„	16.09	„
Nelson	1,240,784	„	2.55	„
Omineca	224,451	„	0.46	„
All others	848,624	„	1.75	„
	48,727,516		100.00	

COPPER.

The amount of copper produced by smelting in the Province in 1916 was 65,379,364 lb. fine copper, valued at the average New York market price for copper at \$17,784,494. These figures represent the amount of copper actually recovered, as nearly as it is possible to ascertain; the amount of copper really in the ores mined would be approximately 25 per cent. greater. This is the largest copper-output in the history of the Province.

As compared with the year 1915, these figures show an increased production in amount of 8,460,959 lb., or about 14.86 per cent. and in value the increase is \$7,948,994, or 55.3 per cent.

The amount of copper produced during the year 1916 is the largest in the history of copper-mining in the Province; the highest previous production, made in 1912, was 51,456,537 lb., valued at \$8,408,513.

The apparently abnormal increase in the value of the production this year is partly due to the high average market value of the metal for the past year, due to the phenomenal demand for munitions of war.

Owing to this heavy demand for war purposes, principally for brass to be used in shells, the market price of copper increased steadily during the year. The year opened with copper at about 22.5 cents a pound in the New York market, and at the end of December it was 29 cents; the average price for the year was 27.202 cents, as compared with an average price of 17.275 cents in 1915. This higher market value of the metal assisted materially in raising the value of the copper produced, thereby greatly stimulating production.

The large increase in quantity of copper produced this year is due to a greatly increased production from the Coast District of some 7,000,000 lb., largely from the *Britannia* mine, while the Granby Company's *Hidden Creek* mine, at Anyox, on Observatory inlet, increased its production by about 2,000,000 lb. The output from the *Rocher Déboulé* mine, in the Omineca Division, was rather less than last year. The Trail Creek Mining Division and the Boundary District made very nearly the same production as last year; the output from Kamloops was greater, chiefly due to increased production from the *Iron Mask*.

The big mine and smelter of the Granby Company at Anyox were operated continuously throughout the year, and the tonnage treated was nearly 2,300 tons a day. The reserves of good-grade ore at this mine are very considerable and are given in the annual report of the company for the fiscal year ended June 30th, 1916, as amounting to 9,416,385 tons, with an average copper content of 2.37 per cent.; in addition to which there is practically an equal tonnage of lower-grade ore. The Granby Company this year produced from its mines in Skeena and Boundary 57.6 per cent. of the Province's copper production.

Another important producer of copper in the northern portion of the Province is the *Rocher Déboulé* mine, near Hazelton. After developing for a couple of years this property commenced shipping in June, 1915, and has produced steadily since that time.

In the Boundary District the Granby Company's mines at Phoenix and smelter at Grand Forks were operated to nearly full capacity, but the output was curtailed during the latter part of the year owing to shortage of coke. Operations at this plant were characterized by the handling of a large amount of material low in copper and highly siliceous which had not previously been classed as ore. This was rendered possible by the high price of copper.

The British Columbia Copper Company, which operates the *Mother Lode* mine at Deadwood and a smelter at Greenwood, was, in former years, another large producer of copper in the Boundary District. During the past year this company's production has again increased very materially; a production of about 3,376,000 lb. of copper being made, chiefly by the *Mother Lode* mine. The company's smelter was operated steadily throughout the year, although also affected somewhat by the coke shortage.

The *Britannia* mine had a very successful year, the tonnage of ore mined and milled being about 400,000 tons, containing 18,000,000 lb. copper, 98,000 oz. silver, and 800 oz. gold. The ore reserves at this mine are large—claimed to be about 17,000,000 tons—and it is expected the yearly tonnage treated will increase still further, as the ultimate plans of the company are to have milling capacity to handle 4,000 tons a day.

The copper-mines on Texada island made about the same output as in 1915; the most important producer is again the *Marble Bay*.

More small shipments of copper ore were made from Vancouver island and along the Coast than in 1915. The high price of copper has stimulated the work of developing copper-showings on the Coast, and while this has not resulted in any great quantity of ore being shipped in 1916, it is likely that a considerable increase of production will take place in 1917.

The only production of copper in the Nelson Division was from the *Eureka* mine, but the reopening of the old *Silver King* mine about the end of the year may assist copper production from this Division in 1917.

The following table shows the production of the various districts for the years 1913, 1914, 1915, and 1916:—

	1913. Lb.	1914. Lb.	1915. Lb.	1916. Lb.	1916. Per Cent.
Boundary District	28,621,973	16,428,959	17,402,662	17,626,623	= 26.97
Rossland District	2,538,661	3,779,830	4,651,681	4,200,745	= 6.42
Coast, Omineca & Cassiar Districts,	14,446,967	24,199,621	34,516,957	42,547,332	= 65.08
Yale-Kamloops District	37,578	14,525	295,164	819,227	= 1.25
Nelson and other Districts	815,126	586,764	51,941	185,437	= 0.28
	46,460,305	45,009,699	56,918,405	65,379,364	100.00

The average assays of the copper ores of the various camps, based upon the copper recovered were as follows:—

Boundary, 0.655 per cent.; Coast, Omineca, and Cassiar, 1.77 per cent.; and Rossland, 0.68 per cent.

Copper-mining is now the most important form of mining in the Province, and this year it more than equalled in value the entire total value of the other lode minerals produced, and was double the value of the coal and coke production. It forms 55.5 per cent. of the total value of metalliferous mines and 42.5 per cent. of the total mineral production. In the working of the large, low-grade copper-deposits and the subsequent smelting of the ores produced, a great number of men are employed and a large proportion of the money value is retained in the country in the payment of wages and purchase of supplies.

All the copper ores carry small amounts of the precious metals, and therefore any increase in the copper production also increases the output of gold and silver. The high price of copper during the past year has stimulated prospecting and the development of copper claims, and there is no doubt that the Provincial output will steadily grow in future years.

The most important metallurgical development in connection with copper-mining during the year 1916 was the establishment of a copper-refinery at the Trail smelter. Until this year all copper produced in the Province was shipped to Eastern points as blister-copper and there refined, but with a start at refining having been made, it may be expected that an increasing amount of the copper-output will be refined in the Province.

The plant at Trail has a capacity of 12 tons of refined copper a day, but is being increased to 17 tons a day; it treats blister-copper from the Trail smelter and part of the blister-copper produced at the Greenwood smelter of the British Columbia Copper Company.

The smelting plant at Ladysmith owned by the Tyee Copper Company, which has lain idle since 1911, was sold near the end of the year, and will be operated by a new company, the Ladysmith Smelting Corporation, Limited. It is said that the purchasers intend to enlarge the smelter, equip it with converters, and possibly to erect a copper-refinery to refine the blister-copper produced.

ZINC.

The total quantity of zinc produced in 1916 was 37,168,980 lb., valued at \$4,043,985, the average New York price, less 15 per cent., being taken as the basis of valuation.

This shows an increase, as compared with the year 1915, of 24,186,540 lb., or 53.6 per cent., in amount, and of \$2,583,461, or 56.5 per cent., in value.

These figures are so very much higher than have ever before occurred in the zinc production of the Province that comparisons are almost out of the question.

The former highest recorded productions were in 1909, when 8,500,000 lb. of zinc was produced, worth \$400,000; in 1914, when the production was \$7,866,467 lb., valued at \$346,125; and in 1915, with 12,982,440 lb., valued at \$1,460,524.

This is one of the instances where the war has been a help, the zinc-mining interests having reaped a harvest that was not expected.

The price of spelter in the New York market averaged for the year 1913, 5.65 cents a pound; for the year 1914 it averaged 5.21 cents; for the year 1915 it averaged 13.23 cents; while the average for 1916 was 12.804 cents.



Maple Bay, Portland Canal, Granby Consol. M. S. & P. Co.



Swamp Point, Portland Canal, Granby Consol. M. S. & P. Co.



Marjorie Mine, Texada Island, Open-cut.



Dock at Iron-mines, Texada Island.

It can readily be seen that such a very great increase in the market value of the metal during the past two years would not only serve as a stimulus to the zinc-miner to get to market every ton of ore he possibly could, but would also permit the mining of many ore-bodies which, at the normal price of zinc, could not have been handled at a profit.

One trouble was that there was not enough smelter capacity on this continent to supply the demand for the metal, and these smelters were soon so overstocked with ores that they ceased to accept ore except on outstanding contracts.

The supply of ore brought out by these conditions was so great that such smelters as were equipped to handle it only bought at a very large margin of profit, so that the zinc-miner did not make as great profits as the increased market price of the metal would seem to indicate.

Of the total output of 37,168,980 lb., 17,854,357 lb. came from the Slocan District, 3,470,036 lb. from Nelson Division, 625,971 lb. from Ainsworth Division, and 14,950,000 lb. from East Kootenay.

The largest producer in the Province was the *Sullivan*, in East Kootenay, which is credited with 14,840,000 lb., followed by the *Standard*, in Slocan Division, with 9,530,000 lb., while the *Lucky Jim*, in Slocan, produced 3,833,000 lb.; the *H.B.*, in Nelson Division, 3,470,000 lb.; the Galena M. and M. Company, in Slocan Division, 2,473,000 lb.; and the *Slocan Star*, 1,334,000 lb.

An important event during the year was the commencement, in the spring, of the production of refined zinc at the new electrolytic zinc plant at the Trail smelter. This plant, which has a capacity of 25 tons a day of refined zinc, uses a new process which takes in the raw ore and turns out refined zinc. This is the first time that zinc ore has ever been refined in a commercial plant in British Columbia, and therefore adds a new industry to those which centre around mining. The plant was designed and built to treat ore from the Consolidated Company's *Sullivan* mine, but towards the end of the year some zinc concentrate was bought from the *Lucky Jim* mine and treated.

For the first time a production of zinc was made from the Omineca Division. This came from the *Silver Standard* mine, and was hand-sorted ore averaging about 40 per cent. zinc and 60 oz. silver.

OTHER MINERALS.

No iron ore has been actually shipped during the past year, but some development and prospecting has again begun, stimulated by the demand for iron and steel which has been emphasized by the war having monopolized all the usual outside sources of supply, while the high freight rates have only made the lack of local production more pronounced.

The consequent strong agitation in favour of a local iron-smelting plant and the hope that such may materialize in the near future has led the owners of iron claims adjacent to the Coast to expect a market for their ores.

As is well-known, there is on the Coast, in the aggregate, an adequate supply of magnetite-iron ore quite sufficiently free from impurities as to be within the "Bessèmer limit."

So far as is at present known, there is on the Coast no developed body of hæmatite or other ore of iron, such as would be desirable to mix with the magnetites for blast-furnace smelting.

A deposit of hæmatite is being developed on the Zymoetz river, a description of which was given in the 1914 Report. Hæmatite is also reported on the Klinaklini river.

Considerable interest has been manifested during the past year in regard to iron-deposits generally, and a bulletin on the subject has been issued and is found elsewhere in this Report under the subdivision Coast District.

A small quantity of crude placer platinum has been recovered on the Tulameen river, in the Similkameen District, estimated at about \$1,700 in value. This was obtained from placer-gold workings being carried on, and the results are considered encouraging.

Prospecting for petroleum by means of boreholes has been in progress in South-East Kootenay, on the Queen Charlotte islands, and elsewhere, but oil in commercial quantities has not yet been encountered.

A small amount of development-work was carried out on the mica claims in the vicinity of Tete Jaune Cache, but no output is yet recorded. Now that the Grand Trunk Pacific Railway has been built within a few miles of these claims, it is pretty well assured that they will be seriously investigated.

Considerable interest has been evinced during the past year in molybdenite deposits, owing to the high price of this mineral, caused by demands for war purposes. This mineral, which is a sulphide of molybdenum, is used in the manufacture of special high-grade steel for guns. The actual output of molybdenite during the year was about 12 tons, estimated to be worth \$20,570. A shipment was made from the *Molly* group, on Lost creek, in the Nelson Mining Division; this shipment amounted to 24 tons of ore and contained by assay about 12 per cent. of molybdenite. Some development-work was done on the property and it is now understood to be under lease and bond to the Orillia Molybdenite Company; which intends to erect a small concentrator. The market requirements are such that a molybdenite ore must be concentrated up to 85 or 90 per cent. molybdenite (MoS_2) before it is marketable. The Lost Creek property has several thousand tons of from 2 to 4 per cent. ore, so that, with a suitable mill, a small production could be maintained.

Another property, on Alice arm, in the Skeena Mining Division, controlled by J. D. Ross, of Seattle, is reported to have a large showing of molybdenite and is described elsewhere in this report under "Alice Arm District." A mill was erected on the property and about 383 tons of 2-per-cent. ore was treated. Other prospects in the Nelson, Kamloops, and Lillooet Mining Divisions showing some molybdenite have been investigated, but as yet none of them have assumed any great importance; 9 tons of ore (16 per cent.) was shipped from Lillooet and 2 tons of 30-per-cent. ore from Keremeos.

Molybdenite ore, concentrated so as to contain 85 to 90 per cent. of that mineral, is now worth about \$2,000 a ton.

The urgent demand for war purposes for antimony and molybdenum caused the Dominion Government Munitions Resources Commission to detail two ex-members of the Geological Survey, W. F. Ferrier and J. C. Gwillim, to spend the best part of the season in British Columbia in search of any available ores of these metals.

It has not yet been learned what success attended these efforts as far as antimony is concerned, though a small shipment was made from Three Forks. The drop in the price of the metal from 40 cents to 12 to 14 cents later in the season discouraged production.

As regards molybdenite ores, Mr. Gwillim reports that he has secured the following shipments:—

<i>Molly</i> mine	15 to 20 tons ore running about 12 per cent. MoS_2 .
<i>Index</i> mine, Texas creek..	9 tons ore running about 16 per cent. MoS_2 .
Alice arm	383 tons ore running about 2 per cent. MoS_2 .
Keremeos	2 tons ore running about 30 per cent. MoS_2 .

It is understood that these ores were shipped to Ottawa and there concentrated in the Government mill up to the required commercial grade of about 85 per cent. MoS_2 , for which payment was made at the rate of approximately \$20 a unit, less a nominal charge for concentrating.

At the *Molly*, the *Index*, and at Alice arm there are considerable tonnages of lower-grade ore, and if these mines were equipped with small but suitable concentrating-mills a regular production could be maintained.

Antimony is another metal which greatly advanced in price owing to demands for war purposes. Its principal use in war material is to harden the lead bullets used in shrapnel. The average price in January, 1916, was 42.55 cents a pound, and in December 14.59 cents. Increased production, especially in China, has brought the price to a more normal point.

Antimony usually occurs in nature as stibnite, the sulphide of antimony, and is a common mineral in British Columbia, occurring in association with lead and zinc ores. It does not, however, as a rule, occur in large quantities, but attempts are now being made in a few places to sort it out from its associated minerals. Twenty-seven tons of antimony ore was shipped from the *Alps-Alturas* property, situated on a fork of Carpenter creek, in the Slovan Mining Division; this ore carried from 50 to 60 per cent. antimony.

Reports of small test shipments from other claims have been heard, but details have not yet been secured.

A deposit of hydromagnesite near the town of Atlin was worked to some extent this year by Armstrong and Morrison, of Vancouver. It is known that a few hundred tons was produced, but details regarding the shipment have

not yet been received. This occurrence of magnesite was fully described by the Provincial Mineralogist in the Minister of Mines' Report for 1904, and later in much greater detail by G. A. Young in the Summary Report of Geological Survey, 1915.

The uses to which the mineral is put are for the manufacture of refractory brick for furnace-linings, etc.; in the manufacture of paper stock by the sulphite process, and as a non-conducting covering for steam boilers and pipes.

A deposit of magnesium sulphate near Kruger mountain, Osoyoos Division, occurs in a flat depression known as Spotted lake, which is a partially dried-up lake containing alternate circles of water and dry places. The magnesium sulphate occurs as a layer all over the lake-bottom, covering a considerable area and said to be of exceptional purity; the thickness of the deposit has not been definitely ascertained. Three hundred tons was extracted and shipped to New York in 1915, where a market at a good price was obtained. The material is used in the drug trade. The nearest town to the deposit is Oroville, Washington, U.S.A., which is distant about six miles.

About 75 tons of talc was shipped from Lillooet this past year.

COAL.

The gross production of coal in 1916 was 2,485,580 long tons, of which 401,487 tons was made into coke, leaving the net production at 2,084,093 tons. These figures show an increase, as compared with 1915, of 513,000 tons gross and of 472,964 tons net. The quantity of coke made was 267,725 tons, which is an increase of about 21,854 tons as compared with 1915. For purposes of comparison the following table is shown:—

	1911.	1912.	1913.	1914.	1915.	1916.
Coal, gross.....tons, 2,240 lb..	2,297,718	3,025,709	2,570,760	2,166,428	1,972,580	2,485,580
Less made into coke .. "	104,656	396,905	433,277	355,461	361,451	401,487
Coal, net..... "	2,193,062	2,628,804	2,137,483	1,810,967	1,611,129	2,084,093
Coke made..... "	66,005	264,333	286,045	234,577	245,871	267,725

Summarizing the Provincial production of coal, the following table shows the output:—

	1913.	1914.	1915.	1916.
Vancouver Island mines.....tons, 2,240 lb.	973,493	1,072,314	1,020,942	1,492,761
Nicola and Similkameen mines..... "	265,542	138,931	99,066	110,549
Crowsnest mines..... "	1,331,725	955,183	852,572	882,270
Total quantity of coal mined..... "	2,570,760	2,166,428	1,972,580	2,485,580
Less made into coke..... "	433,277	355,461	361,451	401,487
Net quantity of coal produced..... "	2,137,483	1,810,967	1,611,129	2,084,093

In addition to the above net production of coal, there was made the coke production shown in the following table:—

	1913.	1914.	1915.	1916.
Vancouver Island collieries.....tons, 2,240 lb.	Nil	Nil	5,450	27,604
Nicola and Similkameen collieries... "	Nil	Nil	Nil	Nil
Crowsnest District collieries..... "	286,045	234,577	240,421	240,121
Total coke production... .. "	286,045	234,577	245,871	267,725

As will be seen from the above figures, the net coal production this year is 472,964 tons more than it was in 1915, and greater than it has been since 1913.

This output would have been considerably greater had not the Crowsnest Collieries met with a series of misfortunes during the year that interfered with production, and in addition to this there was a serious shortage of labour—partly caused by the heavy enlistment of the younger men—and in the fall there were labour troubles.

All these contributed to occasion a shortage of both coal and coke, when the demand was most keen.

Coke.—The production of coke in 1916 was 267,725 tons (2,240 lb.), which is 21,854 tons greater than the preceding year, and, with the exception of the year 1913, is greater than any year since 1905.

The high market price of the metals, particularly copper, kept the copper-smelting plants, both of the Interior and the Coast, running to nearly full capacity, or as the coke-supply would permit.

Of this gross coke production, 240,121 tons was made by the Crow's Nest Pass Coal Company in East Kootenay, and the remaining 27,604 tons was made by the Canadian Collieries at Comox, V.I.

COLLIERIES OF COAST DISTRICT.

The Collieries of the Coast District, which includes those on Vancouver island and in the Nicola-Princeton fields, mined 1,603,310 tons of coal in 1916, while 18,238 tons was taken from stock, making 1,621,548 tons distributed from these collieries in 1916. This amount was distributed thus:—

Sold as coal in Canada	782,733 tons.
Sold as coal in United States	450,926 „
Sold as coal in other countries	6,166 „
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Total sold as coal	1,239,825 tons.
Used under companies' boilers, etc.	135,037 „
Used in making coke	49,496 „
Lost in washing, etc.	197,190 „
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	1,621,548 „
* Minus coal taken from stock	18,238 „
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Gross output	1,603,310 „

The total coal sales of the Coast collieries for the year show, as compared with the sales of the previous year, an increase of 368,219 tons, equivalent to over 42 per cent.

The consumption of coal sold in that part of British Columbia served by the Vancouver Island collieries shows this year an increase of 189,817 tons, or about 38 per cent. from the preceding year; the amount exported to the United States was 183,930 tons greater, and 6,166 tons of coal was exported to other countries.

Only one company in the Coast District—the Canadian Collieries, Limited—has ever made coke, and this year the ovens were again put in operation, after several years of inactivity.

This company produced in 1916 some 27,604 tons (2,240 lb.) of coke, of which 26,043 tons was sold in Canada, and 1,561 tons was added to stock.

On Vancouver Island, five companies produced coal this year—the Canadian Collieries, Limited, the Western Fuel Company, the Pacific Coast Coal Mines, the Vancouver-Nanaimo Coal Company, and the Nanoose Colliery; the majority of these companies each operate two, or more, collieries. The combined gross output of the Island collieries was 1,492,761 tons.

In the Nicola and Princeton coal-fields of the Coast District, the Middlesboro Colliery Company produced 49,005 tons of coal; the Princeton Colliery, 29,458 tons; the Inland Coal and Coke Syndicate (formerly Coal Hill Syndicate), 31,295 tons; the Pacific Coast Colliery Company, 453 tons; and the Merritt Collieries, Limited, 338 tons.

The total output of this portion of the sub-district was 110,549 tons.

EAST KOOTENAY COALFIELD.

There were only two companies operating in this district this past year—the Crow's Nest Pass Coal Company, operating two separate collieries, the combined output of which was 813,250 tons; and the Corbin Coke and Coal Company, which made an output of 69,020 tons; making a gross output for the district for 1916 of 882,270 tons of coal. The Hosmer Mines, Limited, did not operate.

In addition to the coal mined 41 tons was taken from stock, making the amount of coal distributed from the collieries 882,311 tons.

Of this gross tonnage 351,991 tons was used in the manufacture of coke, of which there was produced 240,121 tons (2,240 lb.).

The coke sold this year amounted to 241,790 tons, of which 1,669 tons was taken from stock.

The following table shows the distribution made of the coal of this district:—

Sold as coal in Canada	75,319	tons.
Sold as coal in United States	386,953	„
<hr/>		
Total sold as coal	462,272	tons.
Used by the companies in making coke	351,991	„
Used by the companies under boilers, etc.	68,048	„
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	882,311	„
Minus coal taken from stock	41	„
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Gross output	822,270	„

The greater part of the gross Provincial production is still being mined by three companies—the Crow's Nest Pass Coal Company of East Kootenay, the Canadian Collieries and the Western Fuel Company of Vancouver Island, which mined, collectively, 83.4 per cent. of the gross output, their respective production representing 32.7 per cent., 28.4 per cent., and 22.3 per cent. of such total.

Of the other collieries: In the Coast District, on Vancouver island the Pacific Coast Coal Mines, Limited, produced 153,112 tons, and the Vancouver-Nanaimo Coal Company 78,443 tons; and in the Nicola Valley section of the district, the Middlesboro Colliery Company mined 49,005 tons, the Inland Coal and Coke Company 31,295 tons, the Princeton Coal and Land Company 29,458 tons, and the Pacific Coast Syndicate some 453 tons of coal.

In the East Kootenay District, in addition to the Crow's Nest Pass Coal Company, which produced 813,250 tons, the Corbin Coal and Coke Company produced 69,020 tons.

In addition to those companies actually shipping, several other companies have been installing plant and have approached the shipping stage, mention of which will be made elsewhere in this report.

The collieries of the Coast District, including the Nicola-Princeton fields are to be credited this year with about 55 per cent. of the total coal-output.

The gross output of the collieries of the Province for the past year was, as already stated, 2,485,580 tons, and some 18,279 tons of coal was taken from stock, making the gross amount of coal distributed 2,503,859 tons.

Of this gross amount, there was sold for consumption in Canada, 858,052 tons; sold for consumption in the United States, 837,879 tons; sold in other countries, 6,166 tons; making the total coal sales for the year 1,702,097 tons of 2,240 lb.

In addition to the coal sold, there was used in the manufacture of coke 401,487 tons, and used under companies' boilers, etc., 203,085 tons; while 197,190 tons was lost in washing and screening.

The coke sales of the Province for the past year amounted to 267,833 tons, of which 108 tons was taken from stock.

The following table indicates the markets in which the coal and coke output of the Province was sold :—

COAL.	Coast District.	Crowsnest Pass District.	Total for Province.
Sold for consumption in Canada tons, 2,240 lb.	782,733	75,319	858,052
" export to United States "	450,926	386,953	837,879
" export to other countries "	6,166	.....	6,166
Total coal sales.....	1,239,825	462,272	1,702,097
COKE.			
Sold for consumption in Canada tons, 2,240 lb.	26,043	207,413	233,456
" export to United States ..... "	.....	34,377	34,377
" export to other countries..... "	.....	.....	.....
Total coke sales.....	26,043	241,790	267,833

BUILDING MATERIALS.

The production of building materials in 1916 was slightly less than in the preceding year, being \$1,299,553 as compared with \$1,571,181. The statistical returns are not yet as complete as could be desired, due to the reluctance of a few producers to give returns, but it is believed the figure given above approximates very closely to the actual output. Since 1912, when a production amounting to \$3,435,722 was recorded, the output of building materials has steadily declined, due to the cessation of the building trade, brought about by the continued financial depression, and the war. It is probable that the figures have now reached a minimum, and that an output amounting from \$1,250,000 to \$1,500,000 represents the steady yearly demand for these materials for use in repairs, renewals, and various small demands, without any new construction-work. It may be expected, therefore, that the production will remain at about this figure until a period of active construction-work again commences in the Province. The diminution of production has been general in all kinds of material, except that during the last two years a considerable amount of rough building-stone, in the shape of rough granite blocks, has been used in the construction of the Government piers at the Outer Wharf, Victoria.

The outputs of sand and gravel, of brick, pottery, and cement are all slightly less than in 1915, but the decrease is not serious. The output of fire, face, and lime-silica brick shows an increase, due to a larger production by the Clayburn Company. Approximately 88 per cent. of the total production of building materials comes from the Coast District, and the larger part of this finds its markets in the Coast cities.

In Table V., where the production of building materials is given in detail by districts, the column previously headed "Clay, Gypsum, etc.," has been changed this year to "Miscellaneous Minerals," this column being used for listing the production of hydromagnesite from Atlin, molybdenite from Skeena, Lillooet, and Nelson, and Osoyoos and antimony ore from Slocan. The column formerly headed "Pottery and Tile" now is "Pottery and Clay," and includes the production figures of clay, which are, however, small. No production of gypsum has been recorded as yet.

Excellent building-stone of various sorts is found in abundance in almost every part of the Province; the fact of its widespread distribution has, however, been somewhat against the establishment of large quarrying industries, as a sufficient local supply could always be obtained, and, except within reach of the larger cities, few regularly equipped quarries have been opened.

On the Coast, chiefly between Vancouver island and the Mainland, there are several well-equipped quarries taking out granite, sandstone, and andesite, all of excellent quality. These quarries supply the stone building material of the Coast cities, and have also exported to the United States.

A detailed description of the more important quarries was given in the Report of this Bureau for 1904.

The only important producer during the past year was the Sechelt Granite Quarries, and the output from this, amounting to a little over \$156,000, all went to the Government piers at Victoria.

No production of marble was made last year so far as has been ascertained. **Marble.** Marble-quarries in the Ainsworth Mining District and on Texada island have been partially developed in previous years, but no serious production has yet been started.

Sample slabs from one of the quarries on Texada island sent to the Provincial Museum show a marble very pleasing to the eye and of excellent quality, hard, and taking a good polish. The other quarry in 1914 sent at least one scow-load of large blocks to Vancouver—presumably to be slabbed—but very little further work has since been done.

The production of red brick during the past year was about 3,600 M., **Red Brick.** amounting in value to \$36,194; the price varies from \$8 to \$11 a thousand, according to quality and demand. This small output shows very clearly that but little construction-work has been carried on. It is probable, however, that a considerable quantity of brick is still imported into the Province.

The only company producing firebrick in the Province is the Clayburn **Firebrick.** Company, Limited, with a plant at Clayburn. The fireclay is found here as a bed occurring in bedded rocks of Eocene age. Shales, sandstones, and conglomerates, all but little consolidated, make up this sedimentary series. The shales are quarried or mined for brick-making and one bed is an excellent fireclay. Associated with these rocks is a bed of lignite which is sufficiently good to be used for firing the boilers of the plant. The production of this company was nearly twice as great in 1916 as in the previous year, and is partly accounted for by the fact that the company supplied a lot of the brick products going into the construction of the electrolytic zinc-refinery at Trail. Firebrick is the principal manufactured article produced by this company, but, in addition, considerable quantities of common brick, paving-brick, tiles, drain-pipe, and prepared fireclay are made. The output for the year is valued at about \$164,000.

The British Columbia Pottery Company at Victoria West, which manu- **Pottery Drain-** factures drain and sewer pipes, chimney-tiles, etc., made about the same **pipe and Tile.** production in 1916 as in the previous year. The Port Haney Brick Company, besides manufacturing common brick, also makes drain-pipe, partition-blocks, etc., but only a comparatively small output is made owing to lack of demand for such products.

The manufacture of lime is conducted in a small way at a large number **Lime.** of points in the Province, but only on the Coast has any attempt been made at more extensive operations. In the neighbourhood of Victoria, on Esquimalt harbour three kilns are in operation, and there are kilns on Saanich arm. On Texada island—in addition to the old plant at Marble bay—a new and extensive plant was erected at Blubber bay a few years ago. The limestone being used is of exceptional purity, but in some instances the limestone-beds are cut by igneous dykes which have to be rejected, and this somewhat increases the costs of quarrying.

The production of lime and limestone for 1916 is valued at \$106,000, as compared with \$112,142 in 1915. Production of lime on the southern coast was lessened, but \$24,000 worth of limestone was quarried in Skeena Division for use as flux at the Anyox smelter of the Granby Company.

The Consolidated Mining and Smelting Company quarried its customary yearly amount of limestone at the Fife quarries for use as flux in the furnaces at the Trail smelter. The amount produced in 1916 was 103,282 tons, valued at \$51,641.

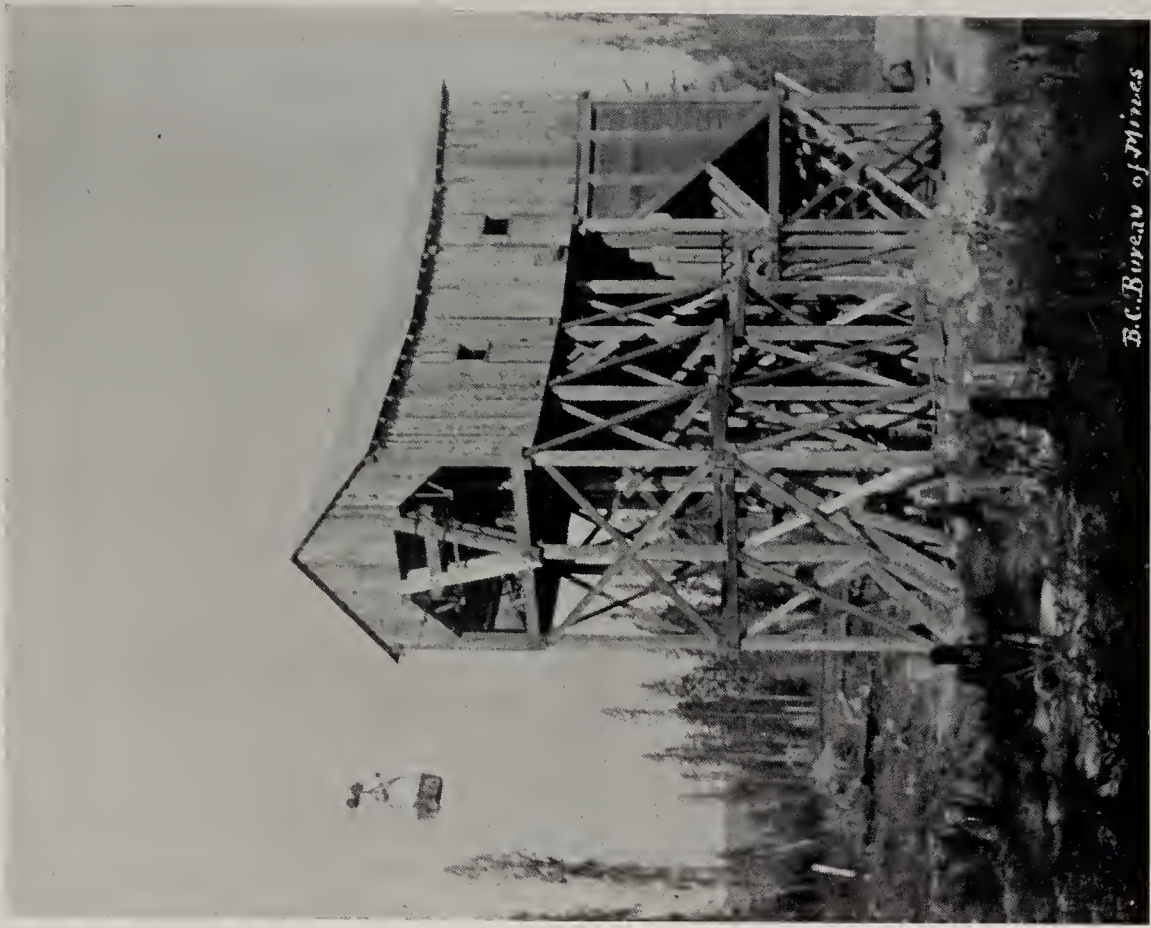
The production of Portland cement in the Province is made by two **Portland Cement.** companies—the Vancouver Portland Cement Company, with works at Tod inlet, and the Associated Cement Company, with works at Bamberton. The combined production amounted to \$436,459, which compares with \$464,690 worth produced in 1915. The cement plant which was started near Princeton and operated for a few months was closed in 1913 and has never resumed operations.

The returns for crushed rock and gravel indicate a falling-off in the demand for this material. Some of the plants which have been in operation for the past two or three years ceased operations, and others made a smaller output than in the previous year.

During the boom years of 1911 and 1912 a number of well-equipped plants were put up near Vancouver and Victoria for supplying washed sand and gravel, properly screened to size. Some of these companies use a system of mining the gravel by hydraulic streams and carrying the product to the screens by the water used. Practically all of these plants are now idle, as there is but little demand for sand and gravel.



Rocher Deboule Mine Camp.



Rocher Deboule Mine, Lower Terminal Tram.

METALLIFEROUS MINES SHIPPING IN 1916.

CASSIAR.

ATLIN MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Engineer	Windy Arm	J. Alexander	Carcross	Gold.
Harper	"	J. L. Harper	"	Gold, silver, lead.
Rufner	Atlin	J. W. Rufner	Atlin	Gold.

SKEENA.

SKEENA MINING DIVISION.

Babington & Jones..	Skeena	H. P. Babington	Prince Rupert	Copper.
Esperanza	Alice Arm	Pedro Salinas	Alice Arm	Gold, silver.
Frisco	Skeena	Wm. Tuttle	Prince Rupert	Silver, copper.
Granby Group	Anyox	Granby Cons. M. S. & P. Co.	Anyox	Copper, gold.

PORTLAND CANAL MINING DIVISION.

Falconer	Portland Canal	F. W. Falconer	Stewart	Silver, lead.
Grey Copper	"	C. E. Clarke	Victoria	"

QUEEN CHARLOTTE MINING DIVISION.

Dorathkalon	Jedway	A. H. Knowlton	Vancouver	Gold, silver, copper.
Ikeda Mines	Ikeda bay	A. Ikeda	Ikeda	Copper, gold.
Tasu	Tasu harbour	T. E. Young	Victoria	Gold, silver, copper.
Wireless	Jedway	P. C. Daykin	Jedway	"

OMINECA MINING DIVISION.

American Boy	Nine-mile mountain	Harris Mines, Ltd.	Hazelton	Gold, silver, lead.
Diamond Group	Hardserable creek	Stanley Ross	Pitman	Copper.
Larkworthy	Hazelton	W. J. Larkworthy	New Hazelton	Silver, copper.
Price	Legate Creek	J. J. Price	Pacific	Silver, copper, lead.
Rocher Déboulé.	Rocher Déboulé mt.	Rocher Déboulé Mining Co.	Tramville	Copper, silver, gold.
Silver Bell	Nine-mile mountain	Geo. T. Stewart	Hazelton	Silver, lead.
Silver Cup	Hazelton	Silver Cup Mines	Prince Rupert	"
Silver Standard	Glen mountain	Silver Standard Mining Co.	Vancouver	"

EAST KOOTENAY.

FORT STEELE MINING DIVISION.

Burton	Elko	A. F. Caldwell	Elko	Copper.
Park Group	Marysville	W. A. Chisholm	Marysville	Silver, lead.
Quantrel	Kimberley	E. E. Jones	Kimberley	"
St. Eugene	Moyie	Consolidated M. & S. Co.	Marysville	"
Sullivan	Kimberley	"	"	"

EAST KOOTENAY—*Concluded.*

WINDERMERE-GOLDEN MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Copper Butte.....				Silver, copper.
Couverapee.....	Field.....	Manager.....	Field.....	Silver, lead.
Giant.....	Carbon Landing.....	Golden Giant Mines.....	Golden.....	"
Hidden Treasure.....				Silver, copper.
Isaac.....	Isaac creek.....	H. E. Forster.....	Wilmer.....	Silver, lead.
Lead Queen.....	Wilmer.....	J. MacLeod.....	".....	"
Monarch.....	Field.....	Minerals Recovery Co.....	Field.....	Silver, lead, zinc.
Nip and Tuck.....	McDonald creek.....	Wm. Haupt.....	Wilmer.....	Silver, lead.
Paradise.....	Toby creek.....	R. R. Bruce.....	".....	"
Silver Belt.....	Windermere.....	F. Stockdale.....	Invermere.....	"

WEST KOOTENAY.

AINSWORTH MINING DIVISION.

Bell.....	Retallack.....	C. F. Caldwell.....	Kaslo.....	Zinc.
Bluebell.....	Riondel.....	New Canadian Metal Co.....	Riondel.....	Silver, lead.
Comfort.....	Ainsworth.....			"
Cork Province.....	Zwicky.....	Cork Province Mines, Ltd.....	Kaslo.....	"
Crescent.....	Ainsworth.....	T. Williams.....	Ainsworth.....	"
Early Bird.....	".....			"
Florence.....	".....	Florence Silver Mining Co.....	Ainsworth.....	"
Gallagher.....	".....	A. D. Wheeler.....	".....	Silver.
Grant & General.....	Woodberry creek.....	G. F. Olson.....	".....	Silver, lead.
Highland.....	Ainsworth.....	Consolidated M. & S. Co.....	".....	"
Maestro.....	".....	".....	".....	"
Martin.....	".....	I. A. Carter.....	Zwicky.....	"
Nicollet.....	".....			"
No. 1.....	South fork, Kaslo creek.....	Consolidated M. & S. Co.....	Ainsworth.....	"
Panama.....	Bear lake.....	H. Giegerich.....	Kaslo.....	Silver.
Retallack.....	Retallack.....	W. H. Burgess.....	".....	Silver, lead, zinc.
Revenue.....	South fork, Kaslo creek.....	L. McLean.....	".....	Silver, lead.
Utica.....	Kaslo.....	Utica Mines, Ltd.....	".....	Silver, lead, zinc.

SLOCAN MINING DIVISION.

Alps-Alturas.....	Carpenter creek.....	W. A. McMillan.....	Vancouver.....	Antimony.
Apex.....	New Denver.....	A. J. Becker.....	New Denver.....	Gold, silver, lead.
Black Grouse.....	Carpenter creek.....	J. D. Ryan.....	Three Forks.....	Silver.
Comstock.....	Slocan.....			Silver, lead.
Elkhorn.....	Sandon.....	G. T. Gormley.....	Sandon.....	"
Galena M. & S. Co.....	Silverton.....	Galena M. & M. Co.....	Silverton.....	"
Hewitt.....	".....	Silverton Mines, Ltd.....	".....	Silver, lead, zinc.
Idaho-Alamo.....	New Denver.....	Thos. Avison.....	New Denver.....	Silver, lead.
Ivanhoe.....	Sandon.....	Minnesota Silver Co.....	Sandon.....	"
Jo-Jo.....				
Lucky Jim.....	Zincton.....	Lucky Jim Zinc Mines, Ltd.....	Kaslo.....	Zinc.
Lucky Thought.....	Silverton.....	Consolidated M. & S. Co.....	Trail.....	Silver, lead.
Majestic-Unexpected.....	Slocan.....	F. H. Bourne.....	Revelstoke.....	"
Mollie Hughes.....	New Denver.....	H. Cleves.....	New Denver.....	Gold, silver.
Noonday.....	Sandon.....	Bruce White.....	Sandon.....	Silver, lead.
Number One.....	".....	J. M. Harris.....	".....	"
Payne.....	".....	Slocan Payne Mines, Ltd.....	".....	"
Queen Bess.....	Slocan.....	Clarence Cunningham.....	".....	"
Rambler-Cariboo.....	Three Forks.....	Rambler Cariboo Mines, Ltd.....	Three Forks.....	"
Reco.....	Sandon.....	Reco M. & M. Co., Ltd.....	Sandon.....	Silver, lead, zinc.
Richmond-Eureka.....	".....	Consolidated M. & S. Co.....	Trail.....	Silver, lead.
Ruth.....	".....	The Ruth Mines, Ltd.....	Kaslo.....	"
Silver King.....				
Slocan Star.....	Sandon.....	Slocan Star Mines, Ltd.....	Sandon.....	Silver, lead, zinc.
Sovereign.....	".....	Clarence Cunningham.....	".....	Silver, lead.
Standard.....	Silverton.....	Standard & Silver Lead Mining Co.....	Silverton.....	Silver, lead, zinc.
Surprise.....	Sandon.....	J. P. McFadden.....	Sandon.....	"
Wonderful.....	".....			Silver, lead.
Yakima.....				"

SLOCAN CITY MINING DIVISION.

Black Prince.....	Springer creek.....	J. T. Tipping.....	Slocan.....	Silver, lead.
Enterprise.....	Ten-mile creek.....	S. S. Fowler.....	Riondel.....	"
Meteor.....	Toby creek.....	G. H. Aylard.....	Victoria.....	Gold, silver.
Ottawa.....	New Denver.....	Consolidated M. & S. Co.....	Trail.....	Silver.

WEST KOOTENAY—*Concluded.*

NELSON MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
California	Toad mountain	W. Moore	Nelson	Gold, silver.
Emerald	Salmo	Iron Mountain, Ltd.	Salmo	Silver, lead.
Eureka	Eagle creek	Eureka Copper Mines.	Nelson	Silver, copper.
Granite	Nelson	Crilly, Wilson, <i>et al.</i>	"	Gold.
H.B.	Salmo	Hudson Bay Zinc Co.	Salmo	Silver, lead, zinc.
Hobson	Ymir	Hobson Silver Lead Co., Ltd.	Ymir	Gold, silver.
Molly Gibson	Nelson	Consolidated M. & S. Co.	Trail	Silver, lead.
Perrier	"	C. C. Crossley	Nelson	Gold, silver, lead.
Rio Tinto	"	"	"	Silver, copper.
Spokane	Canyon creek	Canyon Creek Mining Syndicate.	Nelson	Gold, silver, lead.
Queen	Sheep creek	Queen Mines, Inc.	Sheep Creek	Gold, silver.
Queen Victoria	Nelson	B.C. Copper Co.	Greenwood	Gold, silver, copper.
Queen Victoria Frac.	"	"	"	Silver, copper.

TRAIL CREEK MINING DIVISION.

Centre Star-War				
Eagle	Rossland	Consolidated M. & S. Co.	Rossland	Gold, silver, copper.
Le Roi	"	"	"	"
Le Roi No. 2.	"	Le Roi No. 2, Ltd.	"	"
Velvet	"	Velvet-Portland Mines.	"	"

REVELSTOKE MINING DIVISION.

Lanark	Laurie	Lanark Mining Co.	Illecillewaet	Silver, lead.
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TROUT LAKE MINING DIVISION.

Ferguson-Silver Cup	Ferguson	Ferguson Mines, Ltd.	Kaslo	Silver, lead.
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LARDEAU MINING DIVISION.

Harrigan Mobbs	Lardeau	"	"	Silver, lead.
Old Gold	"	Judge Miller	Bellingham, Wash.	"
Triune	"	Mr. Battey	Minneapolis	"

ARROW LAKE MINING DIVISION.

Millie Mack	Burton	H. E. Forster	Wilmer	Gold, silver, lead.
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BOUNDARY.

GRAND FORKS MINING DIVISION.

Bell	Wallace mountain	Robt. Perry	Beaverdell	Silver, lead.
Bounty Fract.	"	Andrew Matasky	"	Silver.
Humming Bird	Granby river	"	"	"
Little Bertha	"	Fred Knight	Spokane	"
Pathfinder	North fork, Kettle river.	Pathfinder Mine Co., Ltd.	Grand Forks	Gold, silver, copper.
Seattle	Granby river	"	"	"
Union	Franklin Camp	Lewis Johnson	Grand Forks	Gold, silver.

BOUNDARY—*Concluded.*

GREENWOOD MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
B.C.	Eholt	B.C. Copper Co.	Greenwood.	Silver, copper.
Big Copper.	Greenwood	John Moran	"	"
Dayton.	Dayton Camp	W. Eyounkin	Bridenville	Gold, silver, copper.
Emina	Denoro	Consolidated M. & S. Co.	Trail.	"
Granby Consolidated	Phoenix	Granby Cons. M. S. & P. Co	Vancouver	"
Idaho	"	B.C. Copper Co.	Greenwood.	"
International				
Jewel Denoro.	Greenwood	Jewel Denoro Mines, Ltd.	Greenwood.	Gold, silver.
Kokomo.	Beaverdell	G. M. Barrett	Beaverdell	Silver, lead.
Maple Leaf	Franklin Camp	Maple Leaf Mines, Ltd.	Grand Forks.	Gold, silver, copper.
Mother Lode.	Greenwood	B.C. Copper Co.	Greenwood.	"
Orinoco				
Oro Denoro.	Denoro	B.C. Copper Co.	Greenwood.	Gold, silver, copper.
Rawhide	Phoenix	New Dominion Copper Co.	"	"
Sally & Rob Roy	Beaverdell	Van. & Boundary Ck. D. & M. Co.	Beaverdell	Silver, lead.
Sappho.				Silver, copper.
Sunset	Greenwood	New Dominion Copper Co.	Greenwood.	Gold, silver, copper.
Totumpo	Wallace mountain			Silver, copper.
Viking				"

OSOYOOS MINING DIVISION.

Dividend-Lakeview.	Osoyoos	J. L. Greatsinger	Brooklyn, N.Y.	Gold, silver, copper.
Dolphin	Keremeos	C. & W. Jordan	Keremeos Centre.	Silver, copper.
Horn Silver	Similkameen	E. W. Condit.	Similkameen.	Gold, silver.
Nickel Plate.	Hedley	Hedley Gold Mining Co.	Hedley.	Gold.

SIMILKAMEEN, NICOLA, AND VERNON MINING DIVISIONS.

Aberdeen	Nicola	Aberdeen Mines Syndicate	Merritt	Silver, copper.
Baker-Sterns	Merritt	Baker-Sterns Co.	"	Copper.
Golden Sovereign	Nicola	R. J. Armstrong.	"	"
Johnson	Merritt	E. C. Johnson	"	"
Joshua	Nicola	Thos. Hunter	Nicola	Gold, silver, copper.
Little Sioux	Similkameen	G. R. B. Elliott		Copper.
St. George and St.				
Lawrence	Bear creek	Similkameen Mining Co.	Tulameen.	Gold, silver, copper.
Totem Pole.	Thynne creek	Lucky Tod Mining Co.	Merritt	Silver, copper.

YALE, ASHCROFT, AND KAMLOOPS MINING DIVISIONS.

Antimony Group.	Yale	W. S. Clark	Keefers	Antimony.
Chataway Group.	Ashcroft	F. Keffer	Spokane	Copper.
Emancipation.	Yale	C. H. Lighthall	Hope	Gold.
Evening Star	Kamloops	A. S. McArthur	Kamloops.	Silver, copper.
Foghorn	"	Geo. Fennell	Chu Chua	Silver, lead.
Iron Mask	"	Kamloops Copper Co., Ltd.	Kamloops.	Gold, silver, copper.
Silver Daisy	Yale	J. A. Russell	Vancouver	Gold, silver, lead.
Snowstorm	Ashcroft	Stuart Henderson	Victoria	Silver, copper.
Wand Pass	Kamloops	Oscar Hargon	Chu Chua	Gold, silver, copper.

LILLOOET MINING DIVISION.

Coronation	Lillooet	F. H. Forbes	Victoria	Gold.
Lorne	"	A. F. Noel	Lillooet.	"
Pioneer	"	A. Ferguson	Vancouver	"
Wayside.	"	D. C. Paxton	Lillooet.	"

SOUTH COAST.

VANCOUVER MINING DIVISION.

Britannia	Howe Sound	Britannia Mining & Smelting Co.	Britannia Beach	Gold, silver, copper.
West.	Vancouver	G. G. West	Vancouver	Gold, silver.

SOUTH COAST—*Concluded.*

NANAIMO MINING DIVISION.

Mine or Group.	Locality.	Owner or Agent.	Address.	Character of Ore.
Copper Queen	Texada Island	Geo. Buster	Vananda	Gold, silver, copper.
Little Billie	"	Little Billie Mining Co.	"	"
Le Roi	"	Texada Mines, Ltd.	"	Copper. "
Lucky Jim	Valdes Island	Valdes Gold & Copper Co.	Vancouver	Gold, silver, copper.
Lasqueti	Lasqueti Island	F. A. Schaeffer	"	Gold, copper.
Marble Bay	Texada Island	Tacoma Steel Co.	Tacoma.	Gold, silver, copper.
Martin Lee & Marlatt	"	"	"	Gold, copper.
Planta	"	W. S. Planta	Nanaimo	Gold, silver, copper.
Shushartie	Shushartie Bay	H. Skinner	Shushartie	Gold.

NEW WESTMINSTER MINING DIVISION.

Viking	Pitt Lake	Silver, copper.
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VICTORIA MINING DIVISION.

Viva	Cowichan	Joe Gallo	Cowichan	Silver, copper.
Willow Grouse	Sooke	R. G. Mellin	Sooke	Copper.

ALBERNI AND CLAYOQUOT MINING DIVISIONS.

Indian Chief	Clayoquot	Tidewater Copper Co.	Sidney Inlet	Gold, silver, copper.
Monitor	Alberni Canal	Jas. B. Skene	Port Alberni	Copper. "
Sunshine	"	J. B. Woodworth	Vancouver	Silver, copper.

DEPARTMENT OF MINES.

VICTORIA, B.C.

HON. WM. SLOAN	-	-	-	-	Minister of Mines.
R. F. TOLMIE	-	-	-	-	Deputy Minister of Mines.
WM. FLEET ROBERTSON	-	-	-	-	Provinciat Mineralogist and Assayer.
D. E. WHITTAKER	-	-	-	-	Provinciat Anatyst and Assistant Assayer.
JOHN D. GALLOWAY	-	-	-	-	Assistant Provinciat Mineralogist.
GEORGE WILKINSON	-	-	-	-	Chief Inspector of Mines, Victoria.
HENRY DEVLIN	-	-	-	-	District " Nanaimo.
JOHN NEWTON	-	-	-	-	" " "
GEO. O'BRIEN	-	-	-	-	" " Fernie.
THOMAS H. WILLIAMS	-	-	-	-	" " "
ROBERT STRACHAN	-	-	-	-	" " Merritt.
JAMES MCGREGOR	-	-	-	-	" " Netson.
J. H. McMILLAN	-	-	-	-	" " Prince Rupert.
H. H. JOHNSTONE	-	-	-	-	Temporary District Inspector of Mines, Nelson.

GOLD COMMISSIONERS AND MINING RECORDERS.

Mining Divisions.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Atlin Mining Division..	Atlin	J. A. Fraser	W. G. Paxton....	
Sub-office	Discovery			R. Webster.
"	Telegraph Creek..			H. W. Dodd.
"	Haines (U.S.)		(Com. for taking Affidavits)	Risdon M. Odell.
Stikine Mining Division ..	Telegraph Creek ..	H. W. Dodd	H. W. Dodd	
Sub-office	Boundary	"	"	William Strong.
Liard Mining Division ...	Telegraph Creek..	"	"	
Sub-office	Porter			Chas. H. Smith.
"	McDame Creek			Amos Everson.
Skeena Mining Division..	Prince Rupert....	J. H. McMullin...	J. H. McMullin	
Sub-office	Alice Arm			Telka Carney.
"	Kitimat			Geo. L. Anderson.
"	Port Simpson			J. R. C. Deane.
"	Essington			A. Forsythe.
"	Copper City			P. R. Skinner.
"	Terrace			C. E. Doolittle.
"	Stewart (Portland Canal)			P. S. Jack.
"	Anyox			E. H. T. Hyde.
Portland Canal M.D.	Stewart	J. H. McMullin ...	P. S. Jack	
		(at Prince Rupert)		
Bella Coola Mining Div...	Prince Rupert....	J. H. McMullin...	J. H. McMullin ...	
Sub-office	Bella Coola			Brynild Brynildsen.
Queen Charlotte Min'g D.	Queen Charlotte ..	J. H. McMullin ...	John L. Barge.	
Sub-office	Jedway			Isaac Thompson.
"	Masset			C. Harrison.
"	Lockeport			William Morgan.
Omineca Mining Division.	Hazelton	Stephen H. Hoskins	Jas. E. Kirby	
Sub-office	Fort Grahame....			Wm. Fox.
"	Fort St. James ..			Alex. C. Murray.
"	Manson Creek			W. B. Steele.
"	Telkwa			T. J. Thorp.
"	Fort St. John			F. W. Beatton.
"	Copper City			P. R. Skinner.
"	Terrace			C. E. Doolittle.

GOLD COMMISSIONERS AND MINING RECORDERS—*Continued.*

Mining Divisions.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Omineca M.D.— <i>Con.</i>				
Sub-office	Fort Fraser .....	.....	.....	J. S. Alexander.
"	Junction Finlay & Parsnip rivers. ....	.....	.....	Thos. A. Perry.
"	Pacific .....	.....	.....	T. H. McCubbin.
"	Smithers .....	.....	.....	Walter Noel.
"	Burns Lake .....	.....	.....	R. C. Macdonald.
"	Houston .....	.....	.....	Frank L. Mosher.
"	Usk .....	.....	.....	Jas. L. Bethurum.
Peace River Mining Div..	Fort St. John	S. H. Hoskins	F. W. Beaton	
Sub-office	Hudson's Hope	(at Hazelton)		John A. McDougall
"	Pouce Coupe .....	.....	.....	G. J. Duncan.
Cariboo Mining Division..	Barkerville	C. W. Grain .....	.....
Sub-office	Quesnel .....	.....	.....	Geo. Milburn.
"	Fort George .....	.....	.....	T. W. Herne.
"	McBride .....	.....	.....	F. F. O'Halloran.
Quesnel Mining Division..	150-Mile House	C. W. Grain	Arthur Sampson...	
Sub-office	Quesnel	(at Barkerville)	.....	George Milburn.
"	Quesnel Forks .....	.....	.....	Grant Grinder.
"	Barkerville .....	.....	.....	C. W. Grain.
Clinton Mining Division..	Clinton	E. C. Lunn	E. C. Lunn	
Lillooet	Lillooet	John Dunlop	John Dunlop	
Kamloops Mining Division	Kamloops	E. Fisher	L. S. Brown	
Sub-office	Chu Chua .....	.....	.....	George Fennell.
"	Vavenby .....	.....	.....	Hyde Finley.
Ashcroft Mining Division.	Ashcroft	E. Fisher (at Kam.)	H. P. Christie	
Sub-office	Lytton .....	.....	.....	Thos. Somerville.
Nicola Mining Division..	Nicola	E. Fisher (at Kam.)	W. N. Rolfe	
Yale	Yale	" "	L. A. Dodd	
Sub-office	Hope .....	.....	.....	George Blue.
Similkameen Mining Div.	Princeton	Hugh Hunter	Hugh Hunter	
Sub-office	Hedley .....	.....	.....	F. M. Gillespie.
Vernon Mining Division..	Vernon	L. Norris	H. F. Wilmot	
Greenwood Mining Div...	Greenwood	W. R. Dewdney	W. R. Dewdney ..	
Sub-office	Vernon .....	.....	.....	H. F. Wilmot.
"	Rock Creek .....	.....	.....	Jas. Kerr.
"	Beaverdell .....	.....	.....	E. F. Ketchum.
Grand Forks Min. Div....	Grand Forks	S. R. Almond	S. R. Almond	
Osoyoos Mining Division..	Fairview	J. R. Brown	R. D. Tweedie	
Sub-office	Olalla .....	.....	.....	R. W. Northey.
"	Hedley .....	.....	.....	F. M. Gillespie.
Golden Mining Division..	Golden	W. W. Bradley	John Bulman	
Windermere	Wilmer .....	.....	E. M. Sandilands..	
Fort Steele Mining Div...	Cranbrook	N. S. A. Wallinger.	H. S. Clark	
Sub-office	Steele .....	.....	.....	Joseph Walsh.
"	Fernie .....	.....	.....	Ronald Hewat.
"	Moyie .....	.....	.....	John P. Farrell.
"	Marysville .....	.....	.....	Alfred Dryden.
Ainsworth Mining Div ...	Kaslo	R. J. Stenson	A. McQueen	Wm. J. Green.
Sub-office	Howser .....	.....	.....	W. Simpson.
"	Trout Lake .....	.....	.....	Oscar Jacobson.
"	Crawford Bay .....	.....	.....	Thos. W. Lytle.
"	Poplar .....	.....	.....	Arthur G. Johnston

GOLD COMMISSIONERS AND MINING RECORDERS—*Concluded.*

Mining Division.	Location of Office.	Gold Commissioner.	Mining Recorder.	Sub-Recorder.
Slocan Mining Division...	New Denver	R. J. Stenson	Angus McInnes ...	W. J. Parham.
Sub-office	Sandon	(at Kaslo) .....	.....
Slocan City Mining Div...	Slocan	R. J. Stenson	Thos. McNeish....	
Trout Lake Mining Div...	Trout Lake	"	Oscar Jacobson....	
Nelson Mining Division ..	Nelson	John Cartmel.....	S. S. Jarvis.....	W. Forrester. Geo. S. Coleman. James Thompson. G. A. Kennington.
Sub-office	Creston .....	.....	.....
"	Ymir .....	.....	.....
"	Sheep Creek .....	.....	.....
"	Salmo .....	.....	.....
Arrow Lake Min. Division	Nakusp.....	John Cartmel.....	Walter Scott	H. F. Wilmot.
Sub-office	Vernon.....	(at Nelson) .....	.....
Revelstoke Mining Div...	Revelstoke.....	Robt. Gordon	R. S. Squarebriggs.	Newton R. Brown.
Lardeau Mining Division.	Beaton	" (at Revelstoke)	William A. Strutt.	Mrs. A. H. Strutt.
Trail Creek Mining Div...	Rossland	H. R. Townsend...	M. S. Morrell.....	
Nanaimo Mining Division	Nanaimo	S. McB. Smith....	S. McB. Smith....	John Stewart. Ernest H. Robinson Leonard Raper. W. H. Lines. Henry Twidle. R. J. Walker.
Sub-office	Ladysmith.....	.....	.....
"	Alert Bay .....	.....	.....
"	Vananda .....	.....	.....
"	Rock Bay .....	.....	.....
"	Granite Bay.....	.....	.....
"	Heriot Bay .....	.....	.....
Alberni Mining Division..	Alberni	J. E. Hooson....	J. E. Hooson.....	
Clayoquot "	Clayoquot	" (at Alberni)	W. T. Dawley	
Quatsino "	Quatsino	"	O. A. Sherberg....	
Victoria Mining Division..	Victoria	Herbert Stanton...	Herbert Stanton...	
New Westminster Min. D.	New Westminster.	F. C. Campbell....	I. Wintemute.....	L. A. Agassiz. J. Pelly.
Sub-office	Harrison Lake .....	.....	.....
"	Chilliwack	
Vancouver Mining Div...	Vancouver	John Mahony	A. P. Grant.....	

VICTORIA, B.C.:

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